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**Department of Defense  
Fiscal Year (FY) 2021 Budget Estimates**

February 2020



**Chemical and Biological Defense Program**

*Defense-Wide Justification Book Volume 4 of 5*

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

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## Chemical and Biological Defense Program Overview

The Chemical and Biological Defense Program (CBDP) is vital to our Nation's ability to counter current and future threats posed by chemical and biological (CB) weapons. The hazards posed by CB weapons remain real and evolving. An increased willingness to use these types of weapons either for assassinations (e.g. Russia and North Korea) or to achieve asymmetric advantages (e.g. Syria and ISIS in Iraq) indicates eroding international norms against the use of CB weapons. This paradigm shift challenges the ability of the Joint Force to operate unencumbered. The proliferation of knowledge and technology, increased ease of access, difficulty in detecting illicit activities, emerging threats, improved delivery capabilities, and our limited ability to anticipate how adversaries might employ Weapons of Mass Destruction (WMD) heighten the risk of attacks against the U.S. or its allies.

The *2018 National Defense Strategy* (NDS) and Department of Defense (DoD) strategic guidance acknowledges an increasingly complex global security environment, characterized by the re-emergence of long-term, strategic competition between nations and the growing potential for strategic surprise stemming from advances in technology and science. The NDS recognizes the effects of WMD and prioritizes efforts to prevent WMD proliferation, defend the homeland from WMD, and manage the consequences of WMD attacks. We must remain vigilant in preparing and responding to threats from near-peer threat actors. Our adversaries' ambitions and increasing dominance in biotechnology, engineering, and computational science create challenges and opportunities for the Joint Force's battlefield superiority. Therefore, we must lean forward into the future to leverage innovation, integrate our collective CB knowledge, and deploy adaptive solutions to mitigate these enhanced and emerging threats.

Considering the international security environment and the objectives of the NDS, the vision for the CDBP is a Joint Force ready to fight and win in CB-contested environments through a coordinated and integrated effort that systematically neutralizes the chemical and biological threats presented by our adversaries. The CDBP will achieve this vision through its mission to enable the lethality of the Joint Force by anticipating future threats and delivering capabilities that ensure the Warfighter fights and wins in CB-contested environments. These capabilities are a part of an integrated and layered defensive capacity that enables countering weapons of mass destruction (CWMD) missions ranging from major combat operations to Defense Support to Civil Authorities (DSCA) domestic incident response. However, in Fiscal Year (FY) 2021, the program will no longer resource radiological passive defense and tactical disablement efforts to focus the CDBP on its core mission of CB defense. The FY 2021 President's Budget Request includes \$1.29 billion aligned against the highest CB defense priorities for the Department, Joint Services, and Combatant Commands to improve near-term Joint Force readiness and modernize the force to address emerging threats.

## ***Budget Overview***

This FY 2021 budget request supports the NDS and the DoD Strategy for CWMD and will continue to develop capabilities to increase the resiliency of our warfighters and support efforts to deter, prevent, mitigate, respond to, and recover from CB incidents and hazards in the following areas:

- Prevent Surprise (NDS Pillar: Build a More Lethal Force) - Reduce the risk from emerging threats resulting from advances in technology and the increased proliferation of WMD and enablers. Efforts focus on accelerating characterization and early assessment of possible CB hazards by leveraging advances in technology and artificial intelligence.
- Situational Awareness (NDS Pillar: Build a More Lethal Force) – Improve tactical and operational commanders' decisions by developing and fielding better detection and identification capabilities to conduct CB reconnaissance, surveillance, and site exploitation missions. Developmental efforts focus on increasing detection accuracy, range and effectiveness, ensuring that detection data integrates seamlessly with other non-CB sensor systems and relevant information systems, and integration of sensors onto Service-fielded unmanned platforms.
- Protection (NDS Pillar: Build a More Lethal Force) - Enhance mission performance and provide effective protection against current and emerging threats by rapidly developing and fielding modernized protection capabilities. Developmental efforts focus on advances in materials and systems engineering to enhance protective properties against a broader array of hazards, while reducing CWMD operational challenges and logistical burdens. Approaches focus on modular and customizable solutions that are effective against a broad range of challenges in varied environments.
- Hazard Mitigation (NDS Pillar: Build a More Lethal Force) - Preserve combat power by developing and fielding systems that mitigate exposure to CB hazards and restore combat readiness of critical personnel and platforms. Developmental efforts address personnel decontamination, to include handling mass casualties and human remains, along with materiel decontamination, which includes sensitive equipment and aircraft. Novel decontamination approaches focus on broad decontaminant applicability to CB hazards, while minimizing harm to individuals, equipment, and platforms.
- Medical Countermeasures (NDS Pillar: Build a More Lethal Force) - Improve delivery of medical countermeasures to the warfighter by enhancing development through a platform-based approach to enable cost effective and agile delivery of prophylactic, diagnostic, and therapeutic capabilities for known and emerging threats. Developmental efforts focus on advanced vaccines, therapeutic drugs, and diagnostic capabilities that provide safe and effective medical defenses against biological agents (bacteria, toxins, and viruses), emerging infectious diseases, and traditional and non-traditional chemical agents.

## ***FY 2021 Budget Request Highlights***

- The FY 2021 Research, Development, Test and Evaluation (RDT&E) budget request of \$993.7 Million supports key efforts including:
  - \$294 Million supporting RDT&E efforts advancing environmental detection and medical diagnostic capabilities providing enhanced situational awareness of traditional and non-traditional chemical hazards, as well as traditional and emerging biological hazards.
  - \$156 Million to continue support of research and development of Medical Countermeasures (MCMs), such as vaccines and therapeutics, addressing high-priority biological hazards.
  - \$103 Million to continue support of research and development of MCMs focused on protecting against and treating exposure to traditional and non-traditional chemical agents.
  - \$99 Million to support critical CB defense research, development, and test infrastructure and operations.
  - \$78 Million supporting RDT&E for personnel protection, respiratory and ocular protection, collective protection, and hazard mitigation capabilities against traditional and non-traditional CB agents.
  - \$81 Million supporting MCM platform and manufacturing technologies to streamline and accelerate product delivery and reduce developmental risk. Efforts center on leveraging and sustaining the DoD's Advanced Development and Manufacturing capability. Additionally, it resources efforts to improve domestic incident preparedness and response to a CB incident.
  - \$81 Million supporting basic research and threat agent sciences, advancing fundamental knowledge and experimental research in the life and physical sciences.
  - \$51 Million supporting integrated early warning, biosurveillance, warning & reporting, decision support, and modeling and simulation capabilities.
  - \$20 Million supporting concepts development, technology demonstrations, enhanced capability demonstrations, and Special Operations Forces Rapid Capability Development and Deployment to enhance military operational capabilities with technologies and equipment.

- The FY 2021 Procurement budget request of \$297.1 Million supports key efforts including:
  - \$95 Million to procure modernized respiratory and ocular protection for ground and air forces.
  - \$65 Million to procure modernized Analytical Laboratory Systems to enhance and sustain the National Guard – WMD Civil Support Teams analytical capabilities for DSCA. Funding also supports procurement of the Common Analytical Laboratory System capability to integrate a common suite of commercial- and government-off-the-shelf components to provide a common, modular, and transportable/mobile analytical laboratory system to support DoD field analytic units.
  - \$47 Million to procure CBRN Dismounted Reconnaissance Sets, Kits, and Outfits which allows warfighters to perform CBRN dismounted reconnaissance, surveillance, and site assessment of WMD suspect areas not accessible by traditional CBRN reconnaissance-mounted platforms.
  - \$23 Million to procure modernized collective protection capabilities (Joint Expeditionary Collective Protection, and CB Aircraft Survivability Barrier).
  - \$21 Million to procure Enhanced Maritime Biological Detectors to provide the U.S. Navy improved detection and identification capabilities with decreased operational costs and increased reliability for detection of biological agents.
  - \$5 Million to procure improved air crew ensembles to increase protection against advanced chemical threats and decrease physiological burden.

### *Summary*

The proliferation of WMD continues to fall among the greatest challenges facing the United States of America, and the Nation must prioritize improving our ability to counter WMD. Currently, eroding international norms regarding CB weapons use, knowledge proliferation in the areas of advanced biotechnology and unmanned systems, and a diminishing distinction between chemical and biological capabilities all fuel the current CB threat environment. The DoD must remain at the leading edge of innovation and develop technologies to address present and future threats. Accordingly, this budget enables the CBDP to increase the lethality of the Joint Force by ensuring that they can fight and win in CB-contested environments, preserving the security and freedom of our Nation.

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Department of Defense  
 FY 2021 President's Budget  
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 Total Obligational Authority  
 (Dollars in Thousands)

16 Jan 2020

Appropriation	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted (Base+Emerg+ OCO)
Research, Development, Test & Eval, DW	998,721	1,066,187			1,066,187
Total Research, Development, Test & Evaluation	998,721	1,066,187			1,066,187

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<b>Summary Recap of Budget Activities</b> -----					
Basic Research	40,901	48,238			48,238
Applied Research	189,614	215,057			215,057
Advanced Technology Development	140,740	175,486			175,486
Advanced Component Development & Prototypes	115,452	80,162			80,162
System Development & Demonstration	344,745	385,047			385,047
Management Support	125,456	110,363			110,363
Operational Systems Development	41,813	51,834			51,834
Total Research, Development, Test & Evaluation	998,721	1,066,187			1,066,187
<b>Summary Recap of FYDP Programs</b> -----					
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<b>Summary Recap of Budget Activities</b> -----					
Basic Research	45,300				45,300
Applied Research	201,807				201,807
Advanced Technology Development	188,001				188,001
Advanced Component Development & Prototypes	76,167				76,167
System Development & Demonstration	319,976				319,976
Management Support	122,951				122,951
Operational Systems Development	39,530				39,530
<b>Total Research, Development, Test &amp; Evaluation</b>	<b>993,732</b>				<b>993,732</b>
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Appropriation: 0400D Research, Development, Test & Eval, DW

Line No	Program Element Number	Item	Act	FY 2019 (Base + OCO)	FY 2020 Base Enacted	FY 2020 Emergency	FY 2020 OCO Enacted	FY 2020 Total Enacted S (Base+Emergency+OCO)	c
7	0601384BP	Chemical and Biological Defense Program	01	40,901	48,238			48,238	U
		Basic Research		40,901	48,238			48,238	
16	0602384BP	Chemical and Biological Defense Program	02	189,614	215,057			215,057	U
		Applied Research		189,614	215,057			215,057	
44	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	140,740	175,486			175,486	U
		Advanced Technology Development		140,740	175,486			175,486	
78	0603884BP	Chemical and Biological Defense Program - Dem/Val	04	115,452	80,162			80,162	U
		Advanced Component Development & Prototypes		115,452	80,162			80,162	
126	0604384BP	Chemical and Biological Defense Program - EMD	05	344,745	385,047			385,047	U
		System Development & Demonstration		344,745	385,047			385,047	
160	0605384BP	Chemical and Biological Defense Program	06	104,187	110,363			110,363	U
161	0605502BP	Small Business Innovative Research - Chemical Biological Def	06	21,269					U
		Management Support		125,456	110,363			110,363	
204	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	41,813	51,834			51,834	U
		Operational Systems Development		41,813	51,834			51,834	
Total Research, Development, Test & Eval, DW				998,721	1,066,187			1,066,187	

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		Basic Research		45,300				45,300	
16	0602384BP	Chemical and Biological Defense Program	02	201,807				201,807	U
		Applied Research		201,807				201,807	
44	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	188,001				188,001	U
		Advanced Technology Development		188,001				188,001	
78	0603884BP	Chemical and Biological Defense Program - Dem/Val	04	76,167				76,167	U
		Advanced Component Development & Prototypes		76,167				76,167	
126	0604384BP	Chemical and Biological Defense Program - EMD	05	319,976				319,976	U
		System Development & Demonstration		319,976				319,976	
160	0605384BP	Chemical and Biological Defense Program	06	122,951				122,951	U
161	0605502BP	Small Business Innovative Research - Chemical Biological Def	06						U
		Management Support		122,951				122,951	
204	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	39,530				39,530	U
		Operational Systems Development		39,530				39,530	
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Chemical and Biological Defense Program • Budget Estimates FY 2021 • RDT&E Program

Master Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

**BA# 01: Basic Research**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
7	01	0601384BP	CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	-	40.901	48.238	45.300	-	45.300
<b>Total: Basic Research</b>				-	40.901	48.238	45.300	-	45.300

**BA# 02: Applied Research**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
16	02	0602384BP	CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	-	189.614	215.057	201.807	-	201.807
<b>Total: Applied Research</b>				-	189.614	215.057	201.807	-	201.807

**BA# 03: Advanced Technology Development (ATD)**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
44	03	0603384BP	CHEMICAL/BIOLOGICAL DEFENSE (ATD)	-	140.740	175.486	188.001	-	188.001

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(Listing by Budget Activity, then Program Element Number)

**BA# 03: Advanced Technology Development (ATD)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Total: Advanced Technology Development (ATD)</b>				-	140.740	175.486	188.001	-	188.001

**BA# 04: Advanced Component Development & Prototypes (ACD&P)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
78	04	0603884BP	CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	-	115.452	80.162	76.167	-	76.167
<b>Total: Advanced Component Development &amp; Prototypes (ACD&amp;P)</b>				-	115.452	80.162	76.167	-	76.167

**BA# 05: System Development & Demonstration (SDD)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
126	05	0604384BP	CHEMICAL/BIOLOGICAL DEFENSE (EMD)	-	344.745	385.047	319.976	-	319.976
<b>Total: System Development &amp; Demonstration (SDD)</b>				-	344.745	385.047	319.976	-	319.976

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Chemical and Biological Defense Program • Budget Estimates FY 2021 • RDT&E Program  
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 (Listing by Budget Activity, then Program Element Number)

**BA# 06: RDT&E Management Support**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
160	06	0605384BP	CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	-	104.187	110.363	122.951	-	122.951
161	06	0605502BP	SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)	-	21.269	0.000	0.000	-	0.000
<b>Total: RDT&amp;E Management Support</b>				-	125.456	110.363	122.951	-	122.951

**BA# 07: Operational Systems Development**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
204	07	0607384BP	CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	-	41.813	51.834	39.530	-	39.530
<b>Total: Operational Systems Development</b>				-	41.813	51.834	39.530	-	39.530

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Chemical and Biological Defense Program • Budget Estimates FY 2021 • RDT&E Program

Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

**BA# 01: Basic Research**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
7	01	0601384BP	CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)	-	40.901	48.238	45.300	-	45.300
<b>Total: Basic Research</b>				-	40.901	48.238	45.300	-	45.300

**BA# 02: Applied Research**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
16	02	0602384BP	CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)	-	189.614	215.057	201.807	-	201.807
<b>Total: Applied Research</b>				-	189.614	215.057	201.807	-	201.807

**BA# 03: Advanced Technology Development (ATD)**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
44	03	0603384BP	CHEMICAL/BIOLOGICAL DEFENSE (ATD)	-	140.740	175.486	188.001	-	188.001

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Chemical and Biological Defense Program • Budget Estimates FY 2021 • RDT&E Program

Exhibit R-1

(Listing by Budget Activity, then Program Element Number)

**BA# 03: Advanced Technology Development (ATD)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Total: Advanced Technology Development (ATD)</b>				-	140.740	175.486	188.001	-	188.001

**BA# 04: Advanced Component Development & Prototypes (ACD&P)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
78	04	0603884BP	CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)	-	115.452	80.162	76.167	-	76.167
<b>Total: Advanced Component Development &amp; Prototypes (ACD&amp;P)</b>				-	115.452	80.162	76.167	-	76.167

**BA# 05: System Development & Demonstration (SDD)**

**Cost (\$ in Millions)**

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
126	05	0604384BP	CHEMICAL/BIOLOGICAL DEFENSE (EMD)	-	344.745	385.047	319.976	-	319.976
<b>Total: System Development &amp; Demonstration (SDD)</b>				-	344.745	385.047	319.976	-	319.976

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(Listing by Budget Activity, then Program Element Number)

**BA# 06: RDT&E Management Support**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
160	06	0605384BP	CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)	-	104.187	110.363	122.951	-	122.951
161	06	0605502BP	SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)	-	21.269	0.000	0.000	-	0.000
<b>Total: RDT&amp;E Management Support</b>				-	125.456	110.363	122.951	-	122.951

**BA# 07: Operational Systems Development**

Cost (\$ in Millions)

Line#	BA#	PE#	PE Title	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
204	07	0607384BP	CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	-	41.813	51.834	39.530	-	39.530
<b>Total: Operational Systems Development</b>				-	41.813	51.834	39.530	-	39.530

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**Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	40.901	48.238	45.300	-	45.300	45.314	45.310	45.300	45.300	Continuing	Continuing
LF1: <i>Life Sciences (Basic Research)</i>	-	25.272	29.730	29.764	-	29.764	29.778	29.775	29.768	29.768	Continuing	Continuing
PS1: <i>Physical Sciences (Basic Research)</i>	-	15.629	18.508	15.536	-	15.536	15.536	15.535	15.532	15.532	Continuing	Continuing

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

The projects in this program element (PE) advance fundamental knowledge in life and physical sciences. These are basic research efforts directed at promoting theoretical and experimental research in Life and Physical Sciences.

Individual projects include:

- Life Sciences (LF1): fundamental efforts to understand living systems' response to biological or chemical agents, to support detection, diagnostics, protection, and medical treatment (e.g. microbiology, biochemistry, pathogenic mechanisms, cell and molecular biology, immunology, nanoscale science, and information science).

- Physical Sciences (PS1): fundamental scientific phenomena to support investigation of physical and chemical properties and interactions for enhanced functionalities important to detection, diagnostics, protection, and decontamination (e.g. chemistry, physics, materials science, nanotechnologies, nanoscale science, and environmental science).

<b>B. Program Change Summary (\$ in Millions)</b>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>
Previous President's Budget	42.103	45.238	45.369	-	45.369
Current President's Budget	40.901	48.238	45.300	-	45.300
Total Adjustments	-1.202	3.000	-0.069	-	-0.069
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	3.000			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.416	-			
• SBIR/STTR Transfer	-0.786	-			
• Other Adjustments	0.000	-	-0.069	-	-0.069

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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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**Change Summary Explanation**

Funding: FY19 (-\$0.416 Million): Reprogrammings to support Protection & Hazard Mitigation projects in advanced technology development and CBDP Defense Finance and Accounting System transactions.

FY19 (-\$0.786 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+\$3.000 Million): Congressional Add for Water Jet Technology.

FY21 (-\$0.069 Million): Departmental economic adjustment.

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 / Life Sciences (Basic Research)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
LF1: Life Sciences (Basic Research)	-	25.272	29.730	29.764	-	29.764	29.778	29.775	29.768	29.768	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 studying 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)**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Life Sciences	25.272	29.730	29.764
<b>Description:</b> Focuses on fundamental efforts to understand living systems' responses to biological agents, providing knowledge and capabilities that support medical countermeasure development for prophylaxis and therapeutic interventions.			
<b>FY 2020 Plans:</b>			
- Blood-brain barrier - Develop a comprehensive model of the blood-brain barrier molecular antidotes to demonstrate mechanisms of transport for modulators and alphaviruses. Continue to elucidate transport vehicles in established mouse models of blood-brain barrier transport.			
- Viral pathogenesis - Continue modeling of viral structures to second pathogen and begin correlation of data in mouse models. Begin screening delivery molecules for bioavailability and immunogenicity and assess efficacy of single dose protection against multiple viral targets.			
- Biomarkers - Begin testing microneedles and microfluidic extraction studies in vivo and validating biomarker results against industry standards. Correlate biomarkers of various threats against different animal models to understand where further research may be needed.			
- Enabling Science - Continue developing robust genetic control architectures for guidance of antimicrobials against bio threats.			
- Chemical scavengers - Continue to assess the expression of lung alveoli cellular inflammatory receptors and test with potential therapeutic molecules. Assess how cholinergic stimulation of astrocyte networks are affected by chemical agents and therapeutics. Continue to evaluate transport of antibody-targeted nanoparticles loaded with oxime.			
- Animal Models - Initiate selection of animal models and threat/therapeutic classes for data validation. Characterize tissue models against known targets to assess comparability to human organ response. Begin validation of organ and animal models against clinical data.			
- STEM - Supporting Science Technology, Engineering and Math (STEM) strategic efforts to develop talent across the education continuum to enrich our current and future DoD workforce to meet defense technological challenges.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Life Sciences (Basic Research)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Programs ending in FY20:</p> <ul style="list-style-type: none"> <li>- Blood-brain barrier - Complete the development of a comprehensive model of the blood-brain barrier molecular antidotes to demonstrate mechanisms of transport for modulators and alphaviruses.</li> <li>- Enabling Science - Complete the evaluation of collected biomarkers that can indicate infection and give information on the type of infection.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Microbial pathogenesis - Complete the identification of host pathogen interactions utilizing model organisms, such as Burkholderia, Q Fever Filovirus and Alphavirus, to advance knowledge about biological targets in both the pathogen and host.</li> <li>- Animal model development - Continue to enhance animal model knowledge so as to predictively model human disease caused by biological infectious agents and toxins, and enable identification of common targets that facilitate broad-spectrum protection against classes of biological threat agents.</li> <li>- Animal Models Selection and Validation - Continue selection of animal models and threat/therapeutic classes for data validation. Continue to characterize tissue models against known targets to assess comparability to human organ response. Continue validation of organ and animal models against clinical data.</li> <li>- Enabling Technologies - Continue to develop platform technologies, such as artificial intelligence, machine learning, organ-on-a-chip technologies, and nanoparticles to advance broad-spectrum protection strategies engineered to target multiple biological agents, which will provide knowledge useful for development of medical countermeasures capable of defeating broad classes of biological toxins, viruses and bacteria.</li> <li>- Platform Technology - Begin to validate genomic targets for broad anti-alphavirus treatment and establish a screening database of preclinical countermeasures.</li> <li>- Artificial Intelligence (AI) for Early Drug Discovery - Explore the application of machine learning, AI, and other computational tools to inform rational drug discovery, design, optimization, decision support, and medical modeling. Develop a machine learning algorithm to aid in identifying optimal candidates for advanced development of monoclonal antibody biologics.</li> <li>- STEM - Supporting Science Technology, Engineering and Math (STEM) strategic efforts to develop talent across the education continuum to enrich our current and future DoD workforce to meet defense technological challenges.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	25.272	29.730	29.764

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 / Life Sciences (Basic Research)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB2: <i>Chemical Biological Defense (Applied Research)</i>	72.352	87.773	103.497	-	103.497	103.969	108.132	109.257	109.258	Continuing	Continuing
• NT2: <i>Non-Traditional Agents Defense (Applied Research)</i>	43.859	52.902	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	96.761
• TM2: <i>Techbase Medical Defense (Applied Research)</i>	73.403	74.382	98.310	-	98.310	104.666	102.200	102.280	104.075	Continuing	Continuing
• CB3: <i>Chemical Biological Defense (ATD)</i>	22.956	19.798	24.448	-	24.448	24.946	25.239	24.090	24.293	Continuing	Continuing
• NT3: <i>Non-Traditional Agents Defense (ATD)</i>	21.494	24.180	15.308	-	15.308	18.396	18.388	18.384	18.384	Continuing	Continuing
• TM3: <i>Techbase Medical Defense (ATD)</i>	86.713	120.526	137.829	-	137.829	135.016	129.004	129.543	140.685	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 / Physical Sciences (Basic Research)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
PS1: <i>Physical Sciences (Basic Research)</i>	-	15.629	18.508	15.536	-	15.536	15.536	15.535	15.532	15.532	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 science, and nanotechnology that could potentially lead to transformational CB defensive capabilities enhancing Warfighter performance and safety.

Individual efforts in this project include:

- Research results in physics, chemistry, and materials science that have potential application in point and remote detection, diagnostics, protection and decontamination.
- Surface and environmental science focus on the study of physical and chemical properties and phenomena of interactions, especially with regard to Non-Traditional Agents (NTAs), in order 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. Potential applications across CB capability areas include 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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Physical Sciences	15.629	18.508	15.536
<b>Description:</b> Focuses on fundamental scientific phenomena including chemistry, physics, materials science, environmental science, and nanotechnology.			
<b>FY 2020 Plans:</b>			
- Environmental Availability - Determine genetic changes that occur when bacteria enter nonculturable state. Determine conditions that resuscitate bacteria and assess virulence after resuscitation.			
- Photonics - Complete the design and fabrication of photonic components, including nano-scale thermal resonators, functionalized metallic nanohole arrays, and selective sensor coatings for optical resonators. Complete the proof of concept for chemical sensing using these components.			
- Chemical Reactivators - Define mechanistic and structural studies of the aged reactivator complexes.			
- Multifunctional Materials - Synthesize a polymer composition containing the desired volume fraction of polymer blocks as required for successful and stable membrane generation.			
- Catalysts for CB Defense- Combine experimental data and modeling data to determine degradation mechanism. Synthesize metal organic framework (MOF) hybrids and quantify effects of interferent molecules.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Physical Sciences (Basic Research)

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

	FY 2019	FY 2020	FY 2021
<ul style="list-style-type: none"> <li>- Biomimetic - Evaluate molecules for bioremediation conditions that mimic field conditions. Begin to screen catalysts in libraries to validate chemistry.</li> <li>- Novel Destruction - Continue to optimize chemical surrogates and design modifications of lab reactor for use with threat agents.</li> <li>- Conduct fundamental research into water jet technology for tactical CB defeat.</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>- Environmental Availability - name changes to Bio Characterization.</li> <li>- Catalysts for CB Defense - projects realigned to Design Rules For Materials.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Bio Characterization - Determine drivers of genetic change and behavior of pathogens in a nonculturable state. Continue to determine conditions that resuscitate bacteria and assess virulence after resuscitation</li> <li>- Photonics - Begin to characterize photonic component sensitivity and integration of multi-agent chemical sensing. Begin assessment of selectivity needs and testing against mixture vapors.</li> <li>- Chemical Reactivators - Continue mechanistic and structural studies of the aged reactivator complexes.</li> <li>- Multifunctional Materials - Continue to synthesize polymer compositions and modify structures based on mechanical analysis. Begin understanding requirements for scale-up of synthesis and integration into woven fibers.</li> <li>- Design Rules for Materials - Investigate the effects of topology and pore size of metal organic frameworks, and test against simulant molecules. Revise computational models to predict material reaction rates.</li> <li>- Biomimetic - Understand design rules for catalytic hydrolysis of target molecules. Begin characterization of polymers through simulation and comparison to experimental data.</li> <li>- Novel Destruction - Develop a kinetic rates model for organic compounds and Chemical Warfare Agents (CWA) surrogates. Investigate new nano-catalyst synthesis method to reduce material costs and improve catalytic activity.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	15.629	18.508	15.536

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>			<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• CB2: Chemical Biological Defense (Applied Research)	72.352	87.773	103.497	-	103.497	103.969	108.132	109.257	109.258	Continuing	Continuing

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 / Physical Sciences (Basic Research)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>			<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• NT2: <i>Non-Traditional Agents Defense (Applied Research)</i>	43.859	52.902	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	96.761
• TM2: <i>Techbase Medical Defense (Applied Research)</i>	73.403	74.382	98.310	-	98.310	104.666	102.200	102.280	104.075	Continuing	Continuing
• CB3: <i>Chemical Biological Defense (ATD)</i>	22.956	19.798	24.448	-	24.448	24.946	25.239	24.090	24.293	Continuing	Continuing
• NT3: <i>Non-Traditional Agents Defense (ATD)</i>	21.494	24.180	15.308	-	15.308	18.396	18.388	18.384	18.384	Continuing	Continuing
• TM3: <i>Techbase Medical Defense (ATD)</i>	86.713	120.526	137.829	-	137.829	135.016	129.004	129.543	140.685	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	189.614	215.057	201.807	-	201.807	208.635	210.332	211.537	213.333	Continuing	Continuing
CB2: <i>Chemical Biological Defense (Applied Research)</i>	-	72.352	87.773	103.497	-	103.497	103.969	108.132	109.257	109.258	Continuing	Continuing
NT2: <i>Non-Traditional Agents Defense (Applied Research)</i>	-	43.859	52.902	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	96.761
TM2: <i>Techbase Medical Defense (Applied Research)</i>	-	73.403	74.382	98.310	-	98.310	104.666	102.200	102.280	104.075	Continuing	Continuing

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

The projects in this program element (PE) support applied research in the areas of physical technologies, non-traditional agent (NTA) medical and physical defense technologies, and medical technologies. Major efforts support development of vaccines, therapeutics, next generation diagnostics systems, next generation chemical detectors, nerve agent pretreatments, and individual protection advances.

Individual projects include:

- Chemical Biological Defense (CB2): continual improvements in CB physical sciences defense materiel, including contamination avoidance, decontamination, detection and protection technologies, as well as biological weapon/agent surveillance (e.g. CB protective materials, textiles, and filtration, sensors and sensing algorithms, effects modeling, chemical formulations, processes, and methods for hazard mitigation).

- Non-Traditional Agents (NTA) Defense (NT2): supports all NTA efforts (both medical and non-medical) including pretreatments, therapeutics, detection, threat agent science, modeling, protection and hazard mitigation and characterization of emerging threats. Starting in FY21, an administrative change pertaining to efforts of improving S&T budget agility and transition efficiency was applied by merging NTA lines to RDT&E Projects CB2, Chemical Biological Defense and TM2, Techbase Medical Defense.

- Techbase Medical Defense (TM2): development of antidotes, drug treatments, disease surveillance and point-of-need diagnostic devices, patient decontamination and medical technologies management (e.g. drug discovery and platform technology development, biomarkers and assay development useful in drug development and diagnostics, human mimicking devices and regulatory science).

CBDP S&T Applied Research Stakeholders: U.S. Army Combat Capabilities Development Command Chemical Biological Center (CCDC CBC), 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.

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>
0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide / BA 2: Applied Research</i>	PE 0602384BP / <i>CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)</i>

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) activities.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	192.674	202.587	204.863	-	204.863
Current President's Budget	189.614	215.057	201.807	-	201.807
Total Adjustments	-3.060	12.470	-3.056	-	-3.056
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	12.470			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	2.293	-			
• SBIR/STTR Transfer	-5.351	-			
• Other Adjustments	-0.002	-	-3.056	-	-3.056

**Change Summary Explanation**

Funding: FY19 (+\$2.293 Million): Reprogramming to support Threat Agent Science Non-Traditional Agent projects and to develop medical countermeasures against viral and bacterial threat agents.

FY19 (-\$5.351 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+\$12.470 Million): Congressional Add for Coatings Technologies (+\$2.100 Million), program increase to counter biological threats (+\$12.500 Million), and Congressional reduction (-\$2.130 Million).

FY21 (-\$3.056 Million): Program adjustments to balance portfolio to fiscal guidance (-\$2.732 Million) and Departmental economic adjustments (-\$0.324 Million).

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CB2: Chemical Biological Defense (Applied Research)	-	72.352	87.773	103.497	-	103.497	103.969	108.132	109.257	109.258	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. Project NT2, Techbase Non-Traditional Agents Defense, will merge into this Project starting in FY21.

Individual efforts in this project include:

- 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 remote and point detection and identification of chemical and biological agents.
- Decision analysis and management focuses on advanced hazard prediction, medical and epidemiological modeling of biological agents, operational effects and risk assessment, and systems performance modeling.
- Warning and reporting focuses on methods of alerting to chemical or biological threat agent releases and exposures.
- 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.
- Non-Traditional Agent (NTA) Defense including pretreatments, therapeutics, detection, threat agent science, modeling, protection and hazard mitigation and characterization of emerging threats.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Material Contamination Mitigation	6.897	10.923	8.064
<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 2020 Plans:</b>			
- Continue biological hot air decontamination effort to address sensitive equipment, platform interior, and aircraft biological warfare agent decontaminant needs and explore using germinants to enhance the process.			
- Continue coatings research to understand polyurethane coatings and mechanisms of agent absorption and also investigate potential new coatings to improve agent resistance of current polyurethane coatings.			
- 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.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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. Accomplishments/Planned Programs (\$ in Millions)**

	FY 2019	FY 2020	FY 2021
<ul style="list-style-type: none"> <li>- Continue elimination/bulk chemical warfare agent destruction effort, focusing on neutralization and polymerization of bulk chemical warfare agents to explore process optimization and begin scaling efforts.</li> <li>- Continue effort to examine how decontamination technologies perform on field assets using methods reflecting real-world conditions.</li> <li>- Continue efforts to develop/enhance low light agent mapping (disclosure/assurance) technologies.</li> <li>- Continue effort to develop Wide Area Decontamination of chemical warfare agents capability/system.</li> <li>- Develop new materials for novel coatings that promote chemical and biological agent decontamination on surfaces.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integrating the full range of Non-Traditional Agents (NTAs) and other emerging threats into the material contamination mitigation portfolio.</li> <li>- Continue responsive coatings efforts to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals.</li> <li>- Continue effort to examine how decontamination technologies perform on field assets that include battlefield grime when contaminated with impure weapons-grade representative NTAs.</li> <li>- Complete efforts to develop/enhance NTA mapping (disclosure/ assurance) technologies, including generating electronic records of contamination locations.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</li> <li>- Continue optimization of chemical hot air decontamination process.</li> <li>- Continue evaluating polyurethane coatings and potential temporary or permanent coatings to potentially decrease logistical burden of decontamination of polyurethane-coated equipment.</li> <li>- Continue effort to examine how decontamination technologies perform on field assets when contaminated with weapons representative chemical agents by expanding evaluations to include simulated relevant conditions.</li> <li>- Continue elimination/bulk chemical warfare agent destruction effort, focusing on neutralization and polymerization of bulk chemical warfare agents using modeling and expand target chemical warfare agents.</li> <li>- Continue efforts to examine impacts of in operando conditions on the hazard mitigation process to inform "design to future" (next generation) decontamination strategies.</li> <li>- Complete efforts to develop/enhance agent mapping (disclosure/assurance) technologies.</li> <li>- Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents.</li> <li>- Continue Wide Area Decontamination (chemical) efforts to examine analytical methods and test procedures for concrete, asphalt and soil for decontamination of chemical agents.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Decrease due to change in program/project technical parameters. RDT&E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.				
<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 include Chemical Warfare Agents (CWA), Biological Weapons Agents (BWA), and Toxic Industrial Chemicals (TICs). Development of respiratory protection and design for better interoperability to support longer range missions.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Explore trade space for next generation general purpose mask. This subsumes previous efforts for respiratory helmet technology integration.</li> <li>- Continue to evaluate and assemble improved sensor technologies and control systems into Self-Contained Breathing Apparatus (SCBA) platforms, and build multiple Full Spectrum Respiratory Protection System (FSRPS) prototypes for testing.</li> <li>- Continue to explore technologies for oxygen storage and CO2 removal including materials and components, and integrate into FSRPS.</li> <li>- Continue coordination with percutaneous protection whole ensemble developmental efforts to extend the available operational time and improve interfaces with tactical equipment.</li> <li>- Continue efforts that integrate emerging respirator and helmet filtration components and technologies. Improve closure systems for integrated ensemble.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to demonstrate performance enhancements for existing air purification technologies towards TICs.</li> <li>- Continue development and integration of component and system upgrades to existing air purification (including respiratory protection) technologies to provide protection and extended filter life against emerging threats.</li> <li>- Continue to explore trade space for next generation general purpose mask.</li> <li>- Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents.</li> <li>- Complete development and transition systems that provide chemical biological (CB) respiratory protection technologies in support of tactical all hazard, FSRPS.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>		1.867	1.707	2.687
<b>Title:</b> 3) Percutaneous Protection		3.374	3.152	3.929

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to mount compounded materials onto fabrics for protection.</li> <li>- Continue to conduct fiber and yarn analysis to develop knit and woven samples for the evaluation of closures and seals for respirator, helmet integration, and glove integration in order to develop and qualify flexible and stretchable materials for all hazard use.</li> <li>- Continue efforts to scale and evaluate membrane technologies for responsive materials to chemical and biological agents.</li> <li>- Continue development of deliverables including lessons learned and seam sealing for Chemical and Biological Operational Assessment reporting and technical assessments to inform system design and final technical and user assessments.</li> <li>- Conduct additional warfighter demonstrations and assessments of advanced National Fire Protection Association (NFPA) certified fully encapsulated ensemble prototypes with state-of-the art materials that address the full spectrum of threats to guide development and aid in future transition.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue investigation and scaling of membrane materials for protection against NTAs and emerging threats.</li> <li>- Continue investigation of new/novel sorptive materials for percutaneous protection.</li> <li>- Continue development of deliverables including lessons learned and seam sealing against NTAs and emerging threats.</li> <li>- Continue to mount compounded materials onto fabrics for protection.</li> <li>- Continued to conduct fiber and yarn analysis to develop knit and woven samples for the evaluation of closures and seals for respirator, helmet integration, and glove integration in order to develop and qualify flexible and stretchable materials for all hazard use.</li> <li>- Continue efforts to scale and evaluate membrane technologies for materials responsive to chemical and biological agents.</li> <li>- Continue development of deliverables including lessons learned and seam sealing for Chemical and Biological Operational Assessment reporting and technical assessments to inform system design and final technical and user assessments.</li> <li>- Plan and design dual gender Photographic Aerosol System Testing.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>				
<b>Title:</b> 4) Expeditionary Collective Protection		0.640	0.897	1.299

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Develop new technologies for soldiers to determine the remaining chemical vapor service life of their Chemical Warfare Agents (CWA) filters.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue field testing and sampling of guard bed and Residual Life Indicator (RLI) filters.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue evaluation of advanced threats to filtration technologies including NTAs and other emerging threats. Explore new effort for novel filtration against NTAs and other emerging threats in Collective Protection (ColPro) and other large scale filter systems.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials.</li> <li>- Complete field testing and sampling of guard bed and Residual Life Indicator (RLI) filters at fixed sites and provide final report.</li> <li>- Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Assess decontamination effectiveness of different methods of applying decontamination to hair and skin to discern the most efficient way of decontaminating personnel against chemical and biological agents.</li> <li>- Assess reactive sorbent assessment for individual and skin decontamination.</li> <li>- Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue personnel decontamination efforts to enhance current processes including efficacy data against representative NTAs and emerging threats in relevant environments and identifying battlefield interferants.</li> </ul>	0.639	1.365	1.999

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue 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 required to achieve Food and Drug Administration (FDA) approval.</li> <li>- Continue hot air decontamination studies of personal effects (materials) exposed to and contaminated by chemical agents.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</li> <li>- Continue to assess decontamination effectiveness of different methods of applying decontamination to hair and skin to discern the most efficient way of decontaminating personnel against chemical and biological agents.</li> <li>- Continue to identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>			
<p><b>Title:</b> 6) Detection Sensor Technologies</p> <p><b>Description:</b> Focus of this effort is to develop capabilities to detect and identify chemical and biological threats. This activity includes 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 contamination exposure to the warfighter.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete development of final technology in the Man-Worn Chemical Hazard Sensor program and transition for advanced development / testing.</li> <li>- Complete development for technologies to reduce false alarms in a highly complex chemical environment.</li> <li>- Continue concept and technology development for biological and chemical threat early warning detection to include distributed biological reconnaissance capabilities.</li> <li>- Continue development of detection capabilities for identifying genomic editing events.</li> <li>- Continue the development of chemical sensors for collection and detection packages on unmanned platforms.</li> <li>- Continue development of detection technologies to provide unattended monitoring for early indication of airborne chemical threats.</li> </ul> <p>- Additional congressional funding will be used to support chemical detector S&amp;T development in the Compact Vapor Chemical Agent Detector (CVCAD) and Proximity Chemical Agent Detector (PCAD) programs.</p> <p><b>FY 2021 Plans:</b></p>	22.993	25.546	23.566

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Complete development of final technology in the Man-Worn Chemical Hazard Sensor program and transition to CVCAD for advanced development / testing.</li> <li>- Complete development for technologies to reduce false alarms in a highly complex chemical environment.</li> <li>- Continue concept and technology development for biological and chemical threat early warning detection to include distributed biological reconnaissance capabilities.</li> <li>- Continue development of detection capabilities for identifying genomic editing events.</li> <li>- Continue the development of chemical sensors for collection and detection packages on unmanned platforms.</li> <li>- Continue development of detection technologies to provide unattended monitoring for early indication of airborne chemical threats.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 7) Warning and Reporting</p> <p><b>Description:</b> Integrate and fuse disparate sensor data, leverage non-invasive physiological data for detection of threat exposure prior to symptom onset, and provide timely data-driven predictions and warnings.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Develop algorithms to utilize typical and non-typical Intelligence Surveillance and Reconnaissance (ISR) and host-based data available to the warfighter to provide earlier warning of chemical and biological threats and/or exposure.</li> <li>- Investigate individual versus group informatics for earlier warning.</li> <li>- Expand on algorithm development that alerts to warfighter chemical or biological threat agent exposure.</li> <li>- Develop warning and reporting aids for tactical users leveraging the compute resources resident on End User Devices.</li> <li>- Investigate automated approaches using artificial intelligence and machine learning to detect signals and provide earlier warning of chemical and biological threats.</li> <li>- Explore machine learning approaches for reducing sensor false alarm rates.</li> <li>- Develop algorithms to optimize the location of static sensors and optimize the path of moving sensors.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Expand on wearable device-based non-invasive biomarker analysis for pre-symptomatic indication of chemical or biological exposure.</li> <li>- Enhance early warning algorithm development for predicting altered health severity and duration to inform on warfighter time-to-mission-readiness.</li> <li>- Develop a sensor model toolbox application for rapid development of new sensor models.</li> </ul>	-	11.351	6.036

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Continue development of algorithms to optimize the path of moving sensors for detection and source term estimation and develop the capability to react to events.</p> <p>- Continue development of warning and reporting aids for tactical users leveraging the compute resources resident on End User Devices. Explore the use of augmented reality to provide chemical and biological threat situational awareness in head-mounted visual displays.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters. Decrease due to completion of all transitions to Biosurveillance Portal and JWARN.</p>				
<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 capability for predicting the source term of releases of chemical, biological, and industrial materials. Program merged in FY20 under RDT&amp;E Project CB2, Decision Management.</p>		7.253	-	-
<p><b>Title:</b> 9) Data Analysis</p> <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 Chemical Biological (CB) agents on equipment, personnel, and operations. These chapters are developed by a mix of contractors and labs, employing experts in each subject area. Program closed out in FY20, funding covered under RDT&amp;E Project CB2, Decision Analysis and Management.</p>		2.364	-	-
<p><b>Title:</b> 10) Decision Analysis and Management</p> <p><b>Description:</b> Improve battlespace awareness and support decision-making by predicting hazardous material releases and resulting human effects. Provide tools to enable the assessment and mitigation of impacts at personnel, system, tactical, operational, and strategic levels. Develop CBRN data sharing capabilities and information resources.</p> <p><b>FY 2020 Plans:</b> Hazard Prediction:</p> <ul style="list-style-type: none"> <li>- Continue development of coupled indoor and outdoor dispersion models for enhanced hazard prediction in urban environments.</li> <li>- Conduct field trial to collect validation data for coupled indoor and outdoor dispersion models.</li> <li>- Continue development of enhancements to human response models for CBRN agent and toxic industrial chemical exposures.</li> <li>- Continue development of microscale transport and dispersion software for improved hazard prediction in urban environments.</li> <li>- Complete integration of secondary evaporation model with microscale transport and dispersion software.</li> </ul>		-	19.371	20.383

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Complete development of a new software architecture for HPAC to meet Common CBRN Model Interface requirements.</li> <li>- Continue development of next generation littoral waterborne modeling system.</li> </ul> <p>Analytic Applications Platform:</p> <ul style="list-style-type: none"> <li>- Develop and implement data standards for the transmission and storage of information sources relevant to the earlier warning of chemical and biological threat agents.</li> <li>- Complete Air Force, Navy, Army, and Marine Corps service specific human performance studies.</li> <li>- Complete efforts to determine the effects of chemical warfare agents (CWAs) on individual tasks.</li> <li>- Complete direct subsurface direct transport measurement studies and continue modeling contact transfer exposures.</li> <li>- Complete development, revision and integration of CB-1. Host and maintain online accessibility of CB-1 to the CBDP community on the Biosurveillance Ecosystem, as well as enhance online capabilities based on user feedback.</li> <li>- Continue Analysis Support Program in support of Chemical Biological Defense Program stakeholders and exercises.</li> </ul> <p>Medical and Epidemiological Modeling:</p> <ul style="list-style-type: none"> <li>- Enhance capability for modeling particle size dependent casualty estimation and health effects. Incorporate patient casualty condition codes into transport and dispersion models.</li> <li>- Integrate chemical agent modeling into the Naval Health Research Center (NHRC) fielded Joint Medical Planning Tool (JMPT).</li> <li>- Explore Artificial Intelligence (AI) and Machine Learning (ML) approaches to detecting signatures for genetically engineered pathogens.</li> <li>- Initiate efforts to develop ML algorithms for disease prediction and forecasting.</li> <li>- Initiate efforts to model operationally relevant outputs to support medical decision making.</li> </ul> <p><b>FY 2021 Plans:</b></p> <p>Hazard Prediction:</p> <ul style="list-style-type: none"> <li>- Continue development of coupled indoor and outdoor dispersion models for enhanced hazard prediction in urban environments.</li> <li>- Conduct field trial to collect validation data for coupled indoor and outdoor dispersion models.</li> <li>- Complete development of microscale transport and dispersion software for improved hazard prediction in urban environments.</li> <li>- Continue development of next generation littoral and liminal waterborne modeling system.</li> </ul> <p>Medical and Epidemiological Modeling:</p> <ul style="list-style-type: none"> <li>- Initiate biological agent modeling into the NHRC fielded JMPT.</li> <li>- Continue to develop ML algorithms for disease prediction and forecasting for mobile platforms.</li> <li>- Continue to develop ML algorithms to detect signatures of genetically engineered pathogens.</li> </ul>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Continue to develop models to provide operationally relevant outputs to support medical decision making. Integrate outputs into existing comprehensive epidemiological modeling tool.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense (Modeling &amp; Simulation), will merge into this program starting in FY21.</p>				
<p><b>Title:</b> 11) Threat Agent Sciences</p> <p><b>Description:</b> Supports defensive countermeasure development against CB threats by delivering the scientific data, understanding, and relevant human estimates of the hazards posed to humans by exposure to CB agents. Toxicological and/or infectious-dose information and environmental response supports development and/or enhancement of both operational risk and exposure guidelines; identifies gaps in detection and protection; informs decontamination procedures; and supports the development of medical countermeasures. Knowledge generated from this program is used to inform understanding of hazards, hazard prediction models, and materiel and countermeasure development.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue developing advanced methods for threat agent characterization.</li> <li>- Continue developing methods to understand agent fate on operational surfaces.</li> <li>- Continue developing predictive capabilities and models, linking the different properties to provide initial hazard assessment information on emerging threat compounds. Continue delivering data on fate, persistence, and response of priority agents in various environments to inform hazard assessment.</li> <li>- Continue assessing the impact of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, and decontamination).</li> <li>- Continue identifying and assessing technological advancements that will impact the chemical and biological threat space.</li> <li>- Initiate a framework to quickly analyze emerging biological threats.</li> <li>- Initiate a horizon scanning capability to provide situational awareness in assessing technological convergence that can affect the chemical and biological threat space.</li> <li>- Initiate the assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue developing advanced methods for threat agent characterization, including more complex agent mixtures or combinations.</li> <li>- Continue developing methods to understand agent fate on operational surfaces.</li> </ul>		10.490	13.461	35.534

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue developing predictive capabilities and models, linking the different properties to provide initial hazard assessment information on emerging threat compounds.</li> <li>- Continue delivering data on fate, persistence, and response of priority agents in various environments to inform hazard assessment.</li> <li>- Continue assessing the impact of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, and decontamination).</li> <li>- Continue studying employment methods and feasibility for emerging threat agents Continue studies to provide acute toxicity and mechanism of priority NTAs and emerging threat agents using developed computational and medium to high throughput predictive toxicology methods including developed rapid threat assessment and microphysiological systems methods.</li> <li>- Continue identifying and assessing technological advancements that will impact the chemical and biological threat space.</li> <li>- Continue a framework to quickly analyze emerging biological threats.</li> <li>- Continue a horizon scanning capability to provide situational awareness in assessing technological convergence that can affect the chemical and biological threat space.</li> <li>- Continue the assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space.</li> <li>- Initiate characterization studies to close knowledge gaps associated with traditional biological threat to help inform capability development.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>			
<p><b>Title:</b> 12) Operational Effects and 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. Program merged in FY20 under Research Development Test &amp; Evaluation (RDT&amp;E) Project CB2, Decision Management.</p>	5.332	-	-
<p><b>Title:</b> 13) Threat Surveillance</p> <p><b>Description:</b> Integrate disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into chemical and biological threat advanced warning systems, tactical decision aids, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Program ended in FY19.</p>	10.503	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Accomplishments/Planned Programs Subtotals</b>	72.352	87.773	103.497

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CB3: Chemical Biological Defense (ATD)	22.956	19.798	24.448	-	24.448	24.946	25.239	24.090	24.293	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 / Non-Traditional Agents Defense (Applied Research)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
NT2: Non-Traditional Agents Defense (Applied Research)	-	43.859	52.902	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	96.761

**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 and studies conducted under this project address direction from the FDA to conduct specific post-New Drug Application (NDA)-approval efforts and studies (e.g. required studies, Post Marketing Commitments), and requirements from the joint service users. This project is a comprehensive and focused effort for developing Non-Traditional Agents (NTA) defense capabilities, coordinated with specific interagency partners for doctrine, equipment, and training for the Warfighter and civilian population for defense against NTAs.

Individual efforts in this project include:

- 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.
- Provides for the upgrade and modernization of Medical Chemical Defense countermeasures which include U.S. Food and Drug Administration (FDA) approved prophylactics, pre-treatments, and therapeutics and intend to protect and/or sustain the Joint Service Member in a toxic chemical threat environment.

Starting in FY21, an administrative change improving S&T budget agility and transition efficiency will merge NTA lines to RDT&E Projects Chemical Biological Defense (CB2) and Techbase Medical Defense (TM2).

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

	FY 2019	FY 2020	FY 2021
<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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue evaluation of advanced threats to filtration technologies including Non-Traditional Agents (NTAs) and other emerging threats. Explore new effort for novel filtration against NTAs and other emerging threats in Collective Protection (ColPro) and other large scale filter systems.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	0.359	0.790	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 / Non-Traditional Agents Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. This program will merge to RDT&E Project CB2, Chemical Biological Defense starting in FY21.				
<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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integrating the full range of NTAs and other emerging threats into the material contamination mitigation portfolio.</li> <li>- Continue responsive coatings efforts to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals.</li> <li>- Continue effort to examine how decontamination technologies perform on field assets that include battlefield grime when contaminated with impure weapons-grade representative NTAs.</li> <li>- Complete efforts to develop/enhance NTA mapping (disclosure/ assurance) technologies, including generating electronic records of contamination locations.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB2, Chemical Biological Defense starting in FY21.</p>		0.605	0.792	-
<p><b>Title:</b> 3) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue 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 required to achieve FDA approval.</li> <li>- Continue hot air decontamination studies of personal effects (materials) exposed to and contaminated by chemical agents.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		0.359	0.444	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 / Non-Traditional Agents Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. This program will merge to RDT&E Project CB2, Chemical Biological Defense starting in FY21.				
<p><b>Title:</b> 4) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to demonstrate performance enhancements for existing air purification technologies towards TICs.</li> <li>- Continue development and integration of component and system upgrades to existing air purification (including respiratory protection) technologies to provide protection and extended filter life against emerging threats.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB2, Chemical Biological Defense starting in FY21.</p>		1.250	0.791	-
<p><b>Title:</b> 5) Chemical Therapeutics - Medical</p> <p><b>Description:</b> Investigates common mechanisms of agent injury. Physiological parameters and pathological assessments will be used to establish the general mode and mechanism(s) of toxicity to inform countermeasure development. Develops, assesses, evaluates, and validates therapeutics for treatment resulting from exposure to NTAs and emerging chemical threats.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue pursuit of therapeutic compounds to treat NTA exposures including evaluation of licensed FDA therapeutics and use of high-throughput in vitro screens and the ADMET CoE to identify lead candidates. Deliver information on the evaluation of additional FDA licensed/approved products for therapeutic applications for countering the deleterious effects of an NTA exposure to the advanced developer.</li> <li>- Continue animal studies to support regulatory submission of candidate therapeutics for treatment of the toxic effects of selected, priority NTAs.</li> <li>- Continue drug formulation efforts for MCMs with a longer shelf-life and with feasibility of an auto-injector containing material and chemical composition.</li> <li>- Initiate efforts in neuroprotective therapeutics to increase the quality of life after chemical agent exposure.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		10.749	20.700	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 / Non-Traditional Agents Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. This program will merge to RDT&E Project TM2, Techbase Med Defense (Chemical Therapeutics) starting in FY21.				
<p><b>Title:</b> 6) Modeling &amp; Simulation</p> <p><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&amp;V), scaled testing, casualty estimation, and supporting data management.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue development of methodologies to model NTAs with limited source data.</li> <li>- Initiate modeling of toxicokinetic, time, and dosage varying health effects from exposure to NTAs.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB2, Chemical Biological Defense (Decision Analysis and Management) starting in FY21.</p>		1.457	1.714	-
<p><b>Title:</b> 7) Percutaneous Protection</p> <p><b>Description:</b> Study and assessment of percutaneous protective technologies to include membrane and composite material ("novel materials"/"multifunctional materials").</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue investigation and scaling of membrane materials for protection against NTAs and emerging threats.</li> <li>- Continue investigation of new/novel sorptive materials for percutaneous protection.</li> <li>- Continue development of deliverables including lessons learned and seam sealing against NTAs and emerging threats.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB2, Chemical Biological Defense starting in FY21.</p>		0.987	1.195	-
<p><b>Title:</b> 8) Threat Agent Sciences</p> <p><b>Description:</b> Provide critical agent characterization (chemical, physical and physiological/toxicological) data on current and emerging threat agents to prepare for surprise, enabling and informing development and testing of NTA defense technology (e.g., detection, decontamination, protection, and hazard assessment). This characterization of new threats informs decision makers</p>		19.668	20.076	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 / Non-Traditional Agents Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
and development of Concept of Operations (CONOPs) and Tactics, Techniques and Procedures (TTP); it also provides the basis for countermeasure development and assessment.				
<p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue characterizing priority emerging threats to provide critical support data to enable countermeasure development and testing as well as inform CONOPs, policies, doctrines and procedures.</li> <li>- Continue to build linkages between emerging threat characterization and advanced development capability assessments to better define current capability gaps for emerging threats.</li> <li>- Continue evaluating synthesis pathways, physicochemical properties and environmental fate properties for priority threats.</li> <li>- Continue assessing the impact of environmental factors and substrate properties on threat agent activity (e.g. persistence, transport, degradation, resuspension).</li> <li>- Continue preparing laboratory and operationally-relevant toxicity estimates for next priority NTAs.</li> <li>- Continue to refine and deliver human toxicity estimates for next priority NTAs.</li> <li>- Continue development of medium- to high-throughput laboratory approaches to predict acute toxicity and mechanism of action of emerging threat agent.</li> <li>- Continue to expand and refine computational and in vitro research efforts, physical and chemical characterization and behavior to support toxicity evaluation and prediction.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB2, Chemical Biological Defense starting in FY21.</p>				
<p><b>Title:</b> 9) Chemical Pretreatments and Prophylactics - Medical</p> <p><b>Description:</b> Develops pretreatments and prophylactics that provide protection against NTAs and emerging chemical threats. Prophylactic MCMs include catalytic and stoichiometric bioscavengers that rapidly bind and detoxify a broad spectrum of NTAs.</p> <p>Transferred FY19 NT2 funds to NT3 in FY20/21 to support more advanced efforts such as the opioid MCMs and 2-PAM BBB delivery efforts.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue efforts to develop catalytic enzymes for use against selected, priority NTAs.</li> <li>- Continue expanded pre-clinical studies of lead catalytic scavengers to support future investigative new drug (IND) filing.</li> <li>- Continue evaluation of FDA-licensed MCMs for potential pretreatment/prophylaxis against NTAs and emerging chemical threats.</li> </ul>		8.425	6.400	-

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 / Non-Traditional Agents Defense (Applied Research)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
- Continue new approaches to identify pretreatment and prophylaxis against multiple classes of NTAs and emerging chemical threats.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Program/project funding transferred to another funding line. This program will merge to RDT&E Project TM2, Techbase Med Defense (Pretreatments and Prophylactics, Nerve Agents) starting in FY21.			
<b>Accomplishments/Planned Programs Subtotals</b>	43.859	52.902	-

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• NT3: <i>Non-Traditional Agents Defense (ATD)</i>	21.494	24.180	15.308	-	15.308	18.396	18.388	18.384	18.384	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TM2: Techbase Medical Defense (Applied Research)	-	73.403	74.382	98.310	-	98.310	104.666	102.200	102.280	104.075	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. Project NT2, Techbase Non-Traditional Agents Defense, will merge into this Project starting in FY21.

Individual efforts in this project include:

- Core science efforts in Medical Chemical, Medical Biological, Diagnostics, and Medical Countermeasures.
- 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.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Medical Diagnostics	11.869	13.945	14.853
<b>Description:</b> Investigate medical diagnostics ubiquitous and comprehensive against chemical and biological threats (including NTAs, pharmaceutical-based agents, and toxins) by advancing diagnostic innovations; investigating emerging technologies; ensuring medical diagnostics rapid adaptation to emerging threats; harvesting and synergizing the immense volume of diagnostic data; and aligning medical diagnostics capabilities with the FDA pipeline and larger commercial supply chain.			
<b>FY 2020 Plans:</b>			
- Complete assay development for extremely difficult to detect/diagnose intracellular pathogens of severe acute systemic febrile illnesses.			
- Continue the development of a diagnostic platform prototype to diagnose chemical exposure at the point-of-care to nerve agents.			
- Continue to optimize processes and platform technologies to include complementary diagnostics 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.			
- 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.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue efforts to exploit gene-editing systems and synthetic methods for development of robust diagnostic platforms with reduced cold-chain needs.</li> <li>- Continue development of computational tools to include artificial intelligence tools for biological assay development.</li> <li>- Support prototype diagnostics development in the areas of ImmunoAssay Diagnostics System (IADS), Synthetic Molecular Binding Agents (SYMBAs), and Detecting Indicators of Chemical Exposure (DICE).</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue development of a diagnostic platform to diagnose chemical exposure at the point-of-care.</li> <li>- Continue to optimize processes and platform technologies to include complementary diagnostics employed in laboratory characterization of host and pathogen biomarker signatures of exposure and disease.</li> <li>- Continue discovery and identification of host response and/or agent biomarkers.</li> <li>- Continue efforts to exploit gene-editing systems and synthetic methods for development of robust diagnostic platforms with reduced cold-chain needs.</li> <li>- Continue development of computational tools to include artificial intelligence tools for biological assay development.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Maturing approaches are entering from Basic Research.</p>				
<p><b>Title:</b> 2) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Evaluate Q fever vaccines based on selected T and B cell antigens.</li> <li>- Continue development of well-defined animal models for medical countermeasure development against aerosolized biological toxins including marine toxins.</li> <li>- Continue development of nanoparticle and other subunit tularemia vaccines.</li> <li>- Continue development of Burkholderia and Yersinia vaccines.</li> <li>- Continue nonclinical efficacy, safety and manufacturing development of candidate vesicular stomatitis virus (VSV) and DNA vaccines against Marburg virus.</li> <li>- Continue improvements to delivery mechanism, immunogenicity, efficacy and manufacturing of Venezuelan Equine Encephalitis Virus (VEEV) DNA vaccine.</li> <li>- Continue qualification/validation of well-defined animal models for alphaviruses.</li> <li>- Continue development of multiplexed VEEV infection biomarker assay and qualification/validation of VEEV immune assays for clinical and pivotal animal studies.</li> </ul>		21.816	17.486	18.587

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue to assess medical countermeasure (MCM) capabilities and strategies to defend against emerging and genetically engineered biological warfare (BW) threat agents.</li> <li>- Continue evaluation of toxins in animal models.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue analysis of V920 ebolavirus vaccine.</li> <li>- Develop ferret model of filovirus infection.</li> <li>- Continue evaluation of Q fever vaccines based on selected T and B cell antigens.</li> <li>- Continue development of well-defined animal models for medical countermeasure (MCM) development against aerosolized biological toxins including marine toxins.</li> <li>- Continue development of Live Attenuated Vaccine (LAV), nanoparticle and other tularemia vaccines.</li> <li>- Continue nonclinical development of Burkholderia and Yersinia vaccines.</li> <li>- Continue nonclinical efficacy, safety and manufacturing development of candidate vesicular stomatitis virus (VSV) and DNA vaccines against Marburg virus.</li> <li>- Continue improvements to delivery mechanism, immunogenicity, efficacy and manufacturing of VEEV DNA vaccine.</li> <li>- Continue qualification/validation of well-defined animal models for alphaviruses.</li> <li>- Continue development of multiplexed Venezuelan Equine Encephalitis Virus (VEEV) infection biomarker assay and qualification/validation of VEEV immune assays for clinical and pivotal animal studies.</li> <li>- Continue to assess MCM capabilities and strategies to defend against emerging and genetically engineered biological warfare (BW) threat agents.</li> <li>- Continue evaluation of toxins and antitoxin prophylaxis in animal models.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>				
<p><b>Title:</b> 3) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue nonclinical evaluation of hybrid arenavirus and filovirus antigen vaccines in animal models.</li> <li>- Continue evaluation of Burkholderia, Q Fever and filovirus vaccines in the biomimetic Modular Immune In-vitro Construct (MIMIC) system.</li> </ul>		9.733	7.108	7.536

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue development of inactivated alphavirus vaccine.</li> <li>- Continue to qualify/validate MIMIC for use in evaluation of pulmonary responses to biodefense vaccines.</li> <li>- Continue to sustain the Human Specimen Archive at USAMRIID.</li> <li>- Continue evaluation of next generation adjuvants for use in biodefense vaccines.</li> <li>- Continue evaluation of multivalent vaccines against filoviruses.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Initiate nonclinical evaluation of arenavirus vaccines</li> <li>- Continue evaluation of filovirus antigen vaccines in animal models.</li> <li>- Continue evaluation of Burkholderia, Q Fever and filovirus vaccines in the biomimetic Modular Immune In-vitro Construct (MIMIC) system.</li> <li>- Continue development of inactivated alphavirus vaccine.</li> <li>- Continue to qualify/validate MIMIC for use in evaluation of pulmonary responses to biodefense vaccines.</li> <li>- Continue to sustain the Human Specimen Archive at USAMRIID.</li> <li>- Continue evaluation of next generation adjuvants for use in biodefense vaccines.</li> <li>- Continue evaluation of multivalent vaccines against filoviruses.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>				
<p><b>Title:</b> 4) Viral Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate lead candidate therapeutics for efficacy against viral pathogens.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Continue the development of small molecule ribonucleoside viral replication inhibitors directed against alphaviruses.</li> <li>- Continue development of rodent and non-human primate alphavirus animal models for evaluation of therapeutic countermeasures for use with Animal Rule Guidance by the FDA.</li> <li>- Continue optimization of broad-spectrum inhibitors of filovirus infection that antagonize NPC1-GP interactions.</li> <li>- Continue studies to enhance anti-viral therapies against Ebola (Zaire, Sudan, Bundibugyo), and Marburg Viruses.</li> <li>- Continue funding small molecule/repurposing efforts.</li> <li>- Continue feasibility studies on reducing neuro-inflammation by repurposing existing therapeutics. Test feasibility of hemofiltration for treatment of cytokine induced shock from filoviral infection and bacterial-induced sepsis.</li> </ul>		8.556	7.895	8.372

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Continue discovery and early development of novel monoclonal antibodies from survivors to alphavirus and arenavirus infections.</p> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue screening, evaluation and development of novel small molecule inhibitors and monoclonal antibodies effective against filo and encephalitic alpha-virus infections in vitro and in vivo.</li> <li>- Continue studies to enhance anti-viral therapies against Ebola (Zaire), Sudan, Bundibugyo, and Marburg Viruses.</li> <li>- Continue funding small molecule/repurposing efforts.</li> <li>- Continue the development of novel formulations for the delivery of antiviral therapeutics. Begin the identification of host directed therapies for viral targets.</li> <li>- Begin the development of antivirals to arenaviruses. Begin studies to identify host pathways involved in protective immunity against Crimean-Congo hemorrhagic fever.</li> <li>- Continue development of non-human primate encephalitic alphavirus animal models for evaluation of therapeutic countermeasures for use with Animal Rule Guidance by the FDA. Investigate novel host-pathogen interactions as antiviral targets.</li> <li>- Begin investigating host/pathogen interactions in NHPs.</li> <li>- Explore target pathway analysis in mice and NHP to interrogate new potential targets for drug intervention.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Increase due to the expansion of discovery efforts to include new viruses and animal studies.</p>				
<p><b>Title:</b> 5) Bacterial Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate lead therapeutic candidates effective against designated bacterial threat agents.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue the discovery and advancement of novel, non-traditional, as well as traditional, strategies to diversify approaches to identify lead therapeutic candidates against bacterial infection.</li> <li>- Initiate evaluation of the potential of antibody and derivatives to treat intracellular bacterial infection.</li> <li>- Continue evaluation of FDA approved and mid to late stage therapeutics for activity against wild-type and MDR Francisella tularensis, Bacillus anthracis, Yersinia pestis, and Burkholderia species.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue the discovery and advancement of novel, non-traditional (antimicrobial peptides, immunomodulators, host-directed therapies), as well as traditional, strategies to identify lead therapeutic candidates to treat bacterial infections.</li> <li>- Complete discovery of antibody and derivatives to treat intracellular bacterial infection.</li> </ul>		11.579	16.379	17.367

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 Medical Defense (Applied Research)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Develop novel formulations of existing antibiotics to overcome antimicrobial resistance, improve pharmacokinetic parameters, dose-sparing and to enhance antimicrobial killing.</p> <p>- Investigate novel host-pathogen interactions as antibacterial targets. Begin investigating host/pathogen interactions in NHPs.</p> <p>- Explore target pathway analysis in mice and NHP to interrogate new potential targets for drug intervention.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Increase due to the expansion in discovery efforts to include immune modulators and host-target interactions.</p>				
<p><b>Title:</b> 6) Toxin Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate therapeutic candidates that are effective against biological toxin agents.</p> <p><b>FY 2020 Plans:</b></p> <p>- Continue development of a scMAb (single chain monoclonal antibody) which is capable of entering the neuromuscular junction in an attempt to abrogate Botulinum Neurotoxin (BoNT) intoxication.</p> <p><b>FY 2021 Plans:</b></p> <p>- Evaluate small molecule compounds and biologics for efficacy in the treatment and recovery from intoxication by different botulinum serotypes.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		0.156	0.319	0.339
<p><b>Title:</b> 7) Chemical Therapeutics</p> <p><b>Description:</b> Focuses on therapeutic strategies to effectively minimize injuries resulting from exposure to CWAs. This effort involves the development of neuroprotectants, anticonvulsants, improved therapies for enzyme reactivation, and investigation of alternate pathways leading to treatment. This effort also includes discovery and development of therapeutic strategies to treat dermal, ocular and respiratory injuries of CWAs. Efforts in this area are designed to develop potential candidates that will ultimately be submitted for Food and Drug Administration (FDA) licensure or to identify previously licensed products for new uses in the treatment of chemical warfare casualties.</p> <p><b>FY 2020 Plans:</b></p> <p>- Continue validation and characterization of therapeutics for: 1) an improved broad spectrum reactivator and 2) compounds effective in the brain for enhanced neuroprotection and/or increased survival.</p> <p>- Continue exploring technologies for delivery of therapeutics to the brain (crossing the BBB).</p>		9.145	10.713	18.694

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 Medical Defense (Applied Research)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue development of current and screening for novel broad spectrum cholinesterase reactivators that are effective in the brain.</li> <li>- Continue development of animal models for operationally relevant threat agent exposure and medical countermeasure efficacy.</li> <li>- Continue efforts to explore safety and efficacy of down-selected therapeutic decontaminants.</li> <li>- Continue efforts to develop therapeutic medical countermeasures to treat mustard agent pulmonary injury.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue pursuit of therapeutic compounds to treat NTA exposures including evaluation of licensed FDA therapeutics and use of high-throughput in vitro screens to identify lead candidates. Deliver information to the advanced developer on the evaluation of additional FDA licensed/approved products for therapeutic applications for countering the deleterious effects of an NTA exposure.</li> <li>- Continue animal studies to support regulatory submission of candidate therapeutics for treatment of the toxic effects of selected, priority NTAs.</li> <li>- Continue drug formulation efforts for MCMs with a longer shelf-life and with feasibility of an auto-injector.</li> <li>- Continue efforts in neuroprotective therapeutics to increase the quality of life after chemical agent exposure.</li> <li>- Continue validation and characterization of therapeutics for: 1) an improved broad spectrum reactivator and 2) compounds effective in the brain for enhanced neuroprotection and/or increased survival.</li> <li>- Continue exploring technologies for delivery of therapeutics to the brain (crossing the Blood Brain Barrier - BBB).</li> <li>- Continue development of current and screening for novel broad spectrum cholinesterase reactivators that are effective in the brain.</li> <li>- Continue development of animal models for operationally relevant threat agent exposure and medical countermeasure efficacy.</li> <li>- Continue efforts to explore safety and efficacy of down-selected therapeutic decontaminants.</li> <li>- Complete efforts to develop therapeutic medical countermeasures to treat mustard agent pulmonary injury.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>			
<p><b>Title:</b> 8) Pretreatments and Prophylactics, Nerve Agents</p> <p><b>Description:</b> Develop pretreatments and prophylactics that provide protection against chemical warfare agents, including organophosphorus nerve agents (OPNA), such as stoichiometric and catalytic scavengers and other entities that rapidly bind and detoxify a broad spectrum of agents.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue efforts to develop capability for rapid development of medical countermeasures.</li> </ul> <p><b>FY 2021 Plans:</b></p>	0.549	0.537	12.562

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 Medical Defense (Applied Research)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue efforts to develop catalytic enzymes for use against selected, priority NTAs.</li> <li>- Continue expanded pre-clinical studies of lead catalytic scavengers to support future investigative new drug (IND) filing.</li> <li>- Continue evaluation of FDA-licensed MCMs for potential pretreatment/prophylaxis against NTAs and emerging chemical threats.</li> <li>- Continue new approaches to identify pretreatment and prophylaxis against multiple classes of NTAs and emerging chemical threats.</li> <li>- Continue efforts to develop capability for rapid development of medical countermeasures.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT2, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	73.403	74.382	98.310

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• TM3: Techbase Medical Defense (ATD)	86.713	120.526	137.829	-	137.829	135.016	129.004	129.543	140.685	Continuing	Continuing
• MB4: Medical Biological Defense (ACD&P)	63.783	46.166	47.727	-	47.727	37.689	42.517	31.436	35.462	Continuing	Continuing
• MC4: Medical Chemical Defense (ACD&P)	3.685	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.685
• MB5: Medical Biological Defense (SDD)	127.933	130.074	86.460	-	86.460	56.868	45.226	68.593	83.282	Continuing	Continuing
• MC5: Medical Chemical Defense (SDD)	43.648	60.220	54.392	-	54.392	52.813	31.441	15.215	15.019	Continuing	Continuing
• MB7: Medical Biological Defense (Op Sys Dev)	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	140.740	175.486	188.001	-	188.001	188.479	182.473	181.557	192.902	Continuing	Continuing
CB3: <i>Chemical Biological Defense (ATD)</i>	-	22.956	19.798	24.448	-	24.448	24.946	25.239	24.090	24.293	Continuing	Continuing
NT3: <i>Non-Traditional Agents Defense (ATD)</i>	-	21.494	24.180	15.308	-	15.308	18.396	18.388	18.384	18.384	Continuing	Continuing
TM3: <i>Techbase Medical Defense (ATD)</i>	-	86.713	120.526	137.829	-	137.829	135.016	129.004	129.543	140.685	Continuing	Continuing
TT3: <i>Technology Transition (ATD)</i>	-	9.577	10.982	10.416	-	10.416	10.121	9.842	9.540	9.540	Continuing	Continuing

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

The projects in this program element (PE) demonstrate technologies supporting transition to advanced component development for 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 early warning 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.

Individual projects include:

- Chemical Biological Defense (CB3): demonstrations of CB physical science defense technologies, including biological detection, chemical detection, digital battlespace management, and protection, and decontamination. This project continues to pursue solutions against traditional agents.
- Non-Traditional Agents (NTA) Defense (NT3): supports all efforts (both medical and non-medical) including chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation. Starting in FY21, an administrative change pertaining to efforts of improving S&T budget agility and transition efficiency was applied by merging a portion of the NTA lines to RDT&E Projects CB3, Chemical Biological Defense and TM3, Techbase Medical Defense.
- Techbase Medical Defense (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.
- Technology Transition (TT3): pursues federal R&D or commercially available products 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> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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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The CBDP S&T Advanced Technology Development stakeholders: The U.S. Army Combat Capabilities Development Command Chemical Biological Center (CCDC CBC), 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.

Work conducted under this PE will transition to and will provide risk reduction for Advanced Component Development and Prototypes (PE 0603884BP) and System Development and Demonstration (PE 0604384BP) activities.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	142.826	172.486	191.380	-	191.380
Current President's Budget	140.740	175.486	188.001	-	188.001
Total Adjustments	-2.086	3.000	-3.379	-	-3.379
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	3.000			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.183	-			
• SBIR/STTR Transfer	-1.902	-			
• Other Adjustments	-0.001	-	-3.379	-	-3.379

**Change Summary Explanation**

Funding: FY19 (-\$0.183 Million): Reprogramming adjustments to balance overall portfolio efforts.

FY19 (-\$1.902 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+3.000 Million): Congressional Add for Improved Gas Particulate Filter Unit.

FY21 (-\$3.379 Million): Program adjustments to align chem bio incident preparedness and response efforts and techbase technology transition efforts to advanced development (-\$3.078 Million), as well as Departmental economic adjustments (-\$0.301 Million).

Schedule: N/A

Technical: N/A

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
CB3: <i>Chemical Biological Defense (ATD)</i>	-	22.956	19.798	24.448	-	24.448	24.946	25.239	24.090	24.293	Continuing	Continuing

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

Project CB3 develops technology advancements for joint service application in the areas of digital battlespace management technologies, protection/ hazard mitigation and detection. These activities will speed maturing of advanced technologies to reduce risk in system-oriented integration/demonstration efforts. A portion of Project NT3, Techbase Non-Traditional Agents Defense, will merge into this Project starting in FY21.

Individual efforts in this project include:

- Digital battlespace management focuses on situational awareness and threat agent applications, analytic applications platform for operational situational awareness, non-traditional detection sciences, tactical decision aids, and advanced computational methods.
- 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.
- Non-Traditional Agent (NTA) Defense includes chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation.

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) Expeditionary Collective Protection	2.803	0.639	0.814
<b>Description:</b> Develop new technologies for soldiers to determine the remaining chemical vapor service life of their chemical warfare agent (CWA) filters.			
<b>FY 2020 Plans:</b>			
- Continue Expeditionary Collective Protection integration and surveillance Residual Life Indicator (RLI).			
- Continue to pull satellite cartridges and the primary ColPro filter (M98) filters for surveillance testing and assessment.			
- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials.			
<b>FY 2021 Plans:</b>			
- Continue testing of Residual Life Indicator (RLI) systems and evaluating data obtained at fixed site locations and provide final report.			
- Continue scale up materials successfully tested and integrate into filters for testing against threat agents of interest.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Minor change due to routine program adjustments.			
<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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue sprayable slurry decontaminant formulation effort to advance development for tactical decontamination, complete vapor and complex surface efficacy performance evaluations and technical demonstration.</li> <li>- Continue coatings optimization utilizing new chemical agent resistance method to reduce chemical absorption.</li> <li>- Continue Wide Area Decontamination of Bacillus anthracis projects, focusing on varied subscale testing environments, and conduct demonstration.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue responsive coatings optimization against emerging threats under relevant environmental conditions and identifying potential battlefield interferants.</li> <li>- Continue development and optimization of the full range of NTAs, including other emerging threats into the material contamination mitigation portfolio under relevant environmental conditions.</li> <li>- Continue to integrate NTA testing into chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft NTA decontaminant needs in a relevant environment and identifying potential battlefield interferants.</li> <li>- Continue optimization efforts to develop/enhance NTA mapping (disclosure/assurance) technologies in simulated relevant environments.</li> <li>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</li> <li>- Complete sprayable slurry decontaminant formulation effort to advanced development for tactical decontamination, complete vapor and complex surface efficacy performance evaluations and technical demonstration to support relevant data development to transition at Technical Readiness Level (TRL)8.</li> <li>- Complete development of Wide Area Decontamination of Anthrax agricultural spray technology focusing on testing in outdoor environments and related data analysis from demonstrations.</li> <li>- Continue evaluation of disclosure spray in low light and other relevant environments.</li> <li>- Continue evaluation and testing of hot air decontamination of equipment and personal effects.</li> <li>- Complete optimization of chemical hot air decontamination process and transition to Joint Program Manager for Protection (JPM P).</li> <li>- Continue to scale up materials successfully tested and integrate into filters for testing against threat agents of interest.</li> </ul>	1.840	1.952	2.238

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Initiate demonstration of temporary coatings to improve vehicle decontaminatability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. RDT&amp;E Project NT3, Techbase Non-Traditional Agents Defense (Material Contamination Mitigation), will merge into this program starting in FY21.</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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Begin next phase of aerosol system testing using newly validated methodology in support of the Uniform Integrated Protection Ensemble Family of Systems (FoS).</li> <li>- Continue investigation of materials and integration of successfully tested materials into fibers, fabrics, yarns and elastomeric materials.</li> <li>- Continue data evaluation from Chemical and Biological Operational Assessment reporting and technical assessments to inform system design and final technical and user assessments against chemical and biological threats.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integration, engineering, and scaling of CB relevant multifunctional materials and systems.</li> <li>- Continue final technical and user assessments against NTAs and emerging threats on the tactical all hazards suits.</li> <li>- Continue next phase of aerosol system testing to identify mapping gaps and gender-specific factors that impact test results in support of the Uniform Integrated Protection Ensemble Family of Systems (UIPE FoS).</li> <li>- Continue investigation of new/novel sorptive materials for percutaneous protection and integrate into fabrics, yarns, fibers for testing against chemical and biological agents.</li> <li>- Complete development of Level A/B All Hazards ensembles and transition the UIPE FoS program of record through the Joint Program Manager for Protection (JPM P).</li> <li>- Continue to scale up materials successfully tested and integrate into filters for testing against threat agents of interest.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT3, Techbase Non-Traditional Agents Defense (Percutaneous Protection), will merge into this program starting in FY21.</p>		0.596	0.285	1.297
<p><b>Title:</b> 4) 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 (TICs).</p>		0.712	3.962	1.701

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue refining technologies and performance standards that enhance facepiece seals performance, lens fogging resistance, and comfort and demonstrate refined Full-Spectrum Respiratory Protection System (FSRPS) prototype.</li> <li>- Continue to scale up nano-structured porous materials for air purification.</li> <li>- Continue to conduct performance evaluation and demonstration of FSRPS prototypes.</li> <li>- Continue to assess novel filtration materials against new emerging threats.</li> <li>- Continue refining technologies and performance standards that enhance face piece seals performance, lens fogging resistance, and comfort and demonstrate refined FSRPS prototype.</li> <li>- Continue to scale up nano-structured porous materials for air purification.</li> <li>- Continue to conduct performance evaluation and demonstration of FSRPS prototypes.</li> <li>- Continue to assess novel filtration materials against new emerging threats.</li> <li>- Build prototypes of improved gas particulate filter units.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to scale up nano-structured porous materials for air purification.</li> <li>- Continue scale up materials successfully tested and integrate into filters for testing against threat agents of interest.</li> <li>- Complete development and transition systems that provide chemical biological (CB) respiratory protection technologies in support of tactical all hazard, Full-Spectrum Respiratory Protection System (FSRPS).</li> <li>- Continue to assess novel filtration materials against new emerging threats.</li> <li>- Continue integration of successfully tested multifunctional materials capable of sorption and reaction of NTAs for next generation filter applications.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters.</p>			
<p><b>Title:</b> 5) Detection</p> <p><b>Description:</b> Advance and mature technologies and capabilities to detect and identify chemical and biological threats to the point of transitioning to customers for advanced development. This activity includes development of point, remote, or standoff sensors as appropriate, to address both chemical and biological threats. These efforts develop transitionable detection capabilities for early warning of contamination exposure to the warfighter.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue the development of proteomic detection capabilities, to include expansion into the methodologies to detect novel threats.</li> <li>- Continue development of CB sensors for mobile applications to enhance early warning and situational awareness of CB threats.</li> </ul>	5.223	6.156	10.140

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Initiate development of CB sensors for distributed reconnaissance purposes.</p> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete the development of end-to-end genomic sequencing protocols and transition to Targeted Acquisition of Reference of Materials Augmenting Capabilities (TARMAC) initiative.</li> <li>- Complete the HoloLens Joint Handheld Biological Identifier (JHBI) Training aid and transition to SOF Rapid Capability Development &amp; Deployment (RCDD).</li> <li>- Continue development of CB sensors for mobile applications to enhance early warning and situational awareness of CB threats.</li> <li>- Continue development of CB sensors for distributed reconnaissance purposes.</li> <li>- Initiate development of integrated environmental biological sensors for the unattended monitoring of perimeters to provide advanced warning of CB threats.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Increase due to higher priority of emerging bio in FY21.</p>			
<p><b>Title:</b> 6) 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 toxic industrial materials. This program merged to RDT&amp;E Project CB3, Chemical Biological Defense (Decision Management) in FY20.</p>	5.981	-	-
<p><b>Title:</b> 7) Data Analysis</p> <p><b>Description:</b> Develop CBRN 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. This program merged to RDT&amp;E Project CB3, Chemical Biological Defense (Decision Analysis and Management) in FY20.</p>	0.103	-	-
<p><b>Title:</b> 8) Operational Effects</p> <p><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 Chemical Biological Radiological and Nuclear (CBRN) incidents on decision-making. Focus areas include consequence management, population modeling, and knowledge management. This program merged to RDT&amp;E Project CB3, Chemical Biological Defense (Decision Analysis and Management) in FY20.</p>	2.027	-	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 9) Decision Analysis and Management</p> <p><b>Description:</b> Enable the prediction of chemical and biological hazards, exposures, casualties, and infections along with providing timely and accurate warnings and recommended courses of action. Develop methods to utilize non-traditional detection methods to provide indications of Chemical and Biological exposure risk. RDT&amp;E Project CB3, Chemical Biological Defense (Hazard Prediction, Operational Effects and Planning, Data Analysis) merged to this program in FY20.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Mature comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment, and burden estimates from contagious infectious disease outbreaks. Incorporate uncertainty estimates into disease forecasting and prediction models.</li> <li>- Mature data visualization displays of disease model outputs. Incorporate newly characterized threat agent properties into hazard prediction models.</li> <li>- Continue performance optimization and high fidelity enhancements for transport and dispersion models, particularly for urban environments.</li> <li>- Continue development of coupled indoor and outdoor dispersion models for enhanced hazard prediction in urban environments to include advanced methods for interior to exterior transport, uncertainty estimation, and upgrades to user interface.</li> <li>- Implement a high fidelity, building-aware urban dispersion model on an Android End-User Device for improved situational awareness at the tactical edge.</li> <li>- Port previously developed decision support tools to the Tactical Assault Kit (TAK) for use on mobile devices and leverage other plug-ins in TAK for app capability improvement.</li> <li>- Continue configuration management of science and technology prototype for transition of upgraded capabilities.</li> <li>- Complete upgrades to science and technology prototype modules to meet Common CBRN Modeling Interface (CCMI) architecture requirements.</li> <li>- Develop automated decision aids and reference guides to assist tactical users in properly responding to chemical and biological threats.</li> <li>- Develop a tool to support the DoD in responding to a CBRN incident, a toxic industrial chemical (TIC) release, or a contagious epidemic by providing a means of calculating the medical resource requirements necessary to successfully manage the civilian and military consequences.</li> <li>- Complete development of CB-1.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue development and porting of decision support plug-ins for integration with Nett Warrior, TSOA, CBRN IS, and the different iterations of the TAK, including the Android, web, Windows OS, and virtual and augmented reality versions to further leverage the TAK infrastructure and cross-community tools.</li> </ul>	-	5.783	6.852

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Initiate integration of Graphics Processing Units methodologies into hazard prediction software and initiate user testing.</li> <li>- Continue configuration management of science and technology prototype for transition of upgraded capabilities.</li> <li>- Continue performance enhancements for transport and dispersion models, particularly for urban environments.</li> <li>- Continue developing comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, medical planning and treatment.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. RDT&amp;E Project NT3, Techbase Non-Traditional Agents Defense (Modeling &amp; Simulation), will merge into this program starting in FY21.</p>			
<p><b>Title:</b> 10) Threat Surveillance</p> <p><b>Description:</b> Integrate disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced chemical and biological threat warning systems, tactical decision aids, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. This program merged to RDT&amp;E Project CB3, Chemical Biological Defense (Warning and Reporting) in FY20.</p>	3.671	-	-
<p><b>Title:</b> 11) Warning and Reporting</p> <p><b>Description:</b> Develop a framework for integrating and correlating timely, relevant information sources. Investigate new approaches and methodologies such as machine learning, artificial intelligence, and advanced data analysis to accelerate analytical processes and provide early warning of chemical and biological threats.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Develop and implement data standards for the transmission and storage of information sources relevant to the earlier warning of chemical and biological threat agents. Broaden the utility of a previously developed framework to include both tactical and non-specialized users.</li> <li>- Continue research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements settings.</li> <li>- Initiate transition of the Individual Protection System Performance Model to Service users.</li> <li>- Complete the advanced development of the Decontamination System Performance Model.</li> <li>- Complete digitization of historic data and information pertaining to Chemical and Biological warfare at other sites with relevant archival holdings.</li> <li>- Initiate integration of Graphics Processing Units methodologies into hazard prediction software and initiate user testing.</li> </ul> <p>Programs ending in FY20:</p>	-	1.021	1.406

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements settings.</li> <li>- Advanced development of Decontamination System Performance Model.</li> <li>- Development of Individual Protection System Performance Model.</li> <li>- Digitization of historic data and information pertaining to Chemical and Biological warfare at other sites with relevant archival holdings.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue development of approaches to translate raw sensor data and publish to a common standard.</li> <li>- Improve algorithms development that leverage non-invasive physiological monitoring devices to provide earlier warning of chemical and biological threats and/or exposure.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	22.956	19.798	24.448

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	30.879	19.074	10.326	-	10.326	9.853	17.868	14.727	14.294	Continuing	Continuing
• DE4: Decontamination (ACD&P)	6.819	7.235	6.286	-	6.286	8.984	12.865	9.034	7.487	Continuing	Continuing
• IS4: Information Systems (ACD&P)	0.821	0.528	4.661	-	4.661	4.257	4.052	4.048	3.852	Continuing	Continuing
• TE4: Test & Evaluation (ACD&P)	6.293	5.162	4.107	-	4.107	2.822	2.823	2.824	1.601	Continuing	Continuing
• TT4: Technology Transition (ACD&P)	0.000	0.000	0.577	-	0.577	0.866	1.143	1.443	1.443	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 / Non-Traditional Agents Defense (ATD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
NT3: <i>Non-Traditional Agents Defense (ATD)</i>	-	21.494	24.180	15.308	-	15.308	18.396	18.388	18.384	18.384	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. 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 transitioning to advance development.

Individual efforts in this project include:

- 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.

Starting in FY21, an administrative change improving S&T budget agility and transition efficiency will merge a portion of the NTA lines to RDT&E Projects Chemical Biological Defense (CB3) and Techbase Medical Defense (TM3).

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Material Contamination Mitigation	0.517	0.520	-
<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 2020 Plans:</b>			
- Continue responsive coatings optimization against emerging threats under relevant environmental conditions and identifying potential battlefield interferants.			
- Continue development and optimization of the full range of NTAs, including other emerging threats into the material contamination mitigation portfolio under relevant environmental conditions.			
- Continue to integrate NTA testing into chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft NTA decontaminant needs in a relevant environment and identifying potential battlefield interferants.			
- Continue optimization efforts to develop/enhance NTA mapping (disclosure/assurance) technologies in simulated relevant environments.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation decontamination materials.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB3, Chemical Biological Defense starting in FY21.</p>			
<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 personnel effects (materials) exposed to and contaminated by chemical agents by neutralizing and/or physically removing the residual chemical agents.</p> <p><b>FY 2020 Plans:</b> - Continue personnel decontamination efforts to enhance current processes including efficacy data against representative NTAs and emerging threats in relevant environments and identifying battlefield interferants.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB3, Chemical Biological Defense starting in FY21.</p>	0.448	0.408	-
<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 2020 Plans:</b> - Continue to scale up nano-structured porous materials for air purification. - Continue to conduct performance evaluation and demonstration of FSRPS prototypes. - Continue to assess novel filtration materials against new emerging threats.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB3, Chemical Biological Defense starting in FY21.</p>	-	0.688	-
<p><b>Title:</b> 4) Therapeutics - Medical</p> <p><b>Description:</b> Efforts in this area advance the understanding of mechanisms of action for NTAs and emerging chemical threats by probable routes of field exposure and seek to refine effectiveness of therapeutics to advance therapeutic development.</p>	3.097	4.436	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Physiological parameters and pathological assessments will be used to establish the general mode and mechanisms of toxicity required for therapeutic development.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue investigating technologies for delivering therapeutics to the brain.</li> <li>- Continue optimizing and evaluating novel therapeutic in animal models and initiate preclinical studies in support of investigative new drug (IND) submission.</li> <li>- Initiate drug repurposing effort to identify therapeutics for selected NTAs.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project TM3, Techbase Med Defense (Chemical Therapeutics) starting in FY21.</p>			
<p><b>Title:</b> 5) Detection</p> <p><b>Description:</b> Focuses on technologies to provide NTA detection capabilities.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Initiate the development of detection technologies to provide a handheld chemical survey tool to detect and locate deposited liquid and solid threats on surfaces.</li> <li>- Initiate the development of sensor technologies against non-traditional threats of concern.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete the Man-Worn Chemical Hazard Sensor program as the technologies will be transitioned to the CVCAD program for advanced testing/development.</li> <li>- Complete the development of technologies to reduce false alarms in highly complex environments and transition to the Aerosol Vapor Chemical Agent Detector (AVCAD).</li> <li>- Continue the development of sensor technologies against non-traditional threats of concern.</li> <li>- Continue the development of hyperspectral imaging technologies for remote chemical detection.</li> <li>- Initiate the development of chemical collect and detect packages for unmanned platforms to feed into the CBRN Sensors on Robotic Platforms (C-SIRP).</li> <li>- Initiate the development of chemical sensor platforms for unmanned systems to also feed into the C-SIRP program.</li> <li>- Continue rapid prototyping and evaluation of chemical detection platforms addressing standoff chemical detection and distributed CB reconnaissance capabilities.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	10.391	11.434	15.308

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Non-Traditional Agents Defense (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred from another funding line. RDT&E Project NT3, Techbase Non-Traditional Agents Defense (Test & Evaluation), will merge into this program starting in FY21.			
<p><b>Title:</b> 6) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Perform research studies to provide objective, quantitative analyses in support of science and technology initiatives, material developments, and operational guidance for the Chemical and Biological Defense Program.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Minor change due to routine program adjustments. This program will merge to RDT&amp;E Project CB3, Chemical Biological Defense (Decision Analysis and Management) starting in FY21.</p>	0.201	0.236	-
<p><b>Title:</b> 7) 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue integration, engineering, and scaling of CB relevant multifunctional materials and systems.</li> <li>- Continue final technical and user assessments against NTAs and emerging threats on the tactical all hazards suits.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p> <p>Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project CB3, Chemical Biological Defense starting in FY21.</p>	0.991	0.588	-
<p><b>Title:</b> 8) Test &amp; Evaluation</p> <p><b>Description:</b> Develop test and evaluation technologies and processes in support of NTA activities.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete the rapid prototyping and evaluation of chemical detection platforms addressing wearable vapor detection technologies.</li> <li>- Continue rapid prototyping and evaluation of chemical detection platforms addressing standoff chemical detection capabilities.</li> </ul>	0.963	0.785	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
- Initiate rapid prototyping and evaluation of chemical detection platforms addressing distributed CB reconnaissance capabilities.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Program/project funding transferred to another funding line. This program will merge to RDT&E Project NT3, Non-Traditional Agent (NTA) Defense (Detection) starting in FY21.			
<b><i>Title:</i></b> 9) Pretreatments and Prophylactics - Medical	4.886	5.085	-
<b><i>Description:</i></b> Develop pretreatments and prophylactics that provide protection against NTAs and emerging chemical threats. Prophylactic scavengers should rapidly detoxify a broad spectrum of compounds of interest (COIs).			
<b><i>FY 2020 Plans:</i></b> - Continue efforts to develop OPNA catalytic scavenger enzymes in support of investigational new drug (IND) submission to the FDA. - Initiate prophylactic studies of Medical Countermeasures (MCMs) against additional selected NTAs and continue efforts as needed.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Program/project funding transferred to another funding line. This program will merge to RDT&E Project TM3, Techbase Med Defense (Chemical Therapeutics) starting in FY21.			
<b>Accomplishments/Planned Programs Subtotals</b>	21.494	24.180	15.308

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• CA4: Contamination Avoidance (ACD&P)	30.879	19.074	10.326	-	10.326	9.853	17.868	14.727	14.294	Continuing	Continuing
• DE4: Decontamination (ACD&P)	6.819	7.235	6.286	-	6.286	8.984	12.865	9.034	7.487	Continuing	Continuing
• IP4: Individual Protection (ACD&P)	3.172	1.997	2.483	-	2.483	3.487	0.000	4.682	8.946	Continuing	Continuing
• MC4: Medical Chemical Defense (ACD&P)	3.685	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.685
• TE4: Test & Evaluation (ACD&P)	6.293	5.162	4.107	-	4.107	2.822	2.823	2.824	1.601	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
N/A

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 Medical Defense (ATD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
TM3: <i>Techbase Medical Defense (ATD)</i>	-	86.713	120.526	137.829	-	137.829	135.016	129.004	129.543	140.685	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. A portion of Project NT3, Techbase Non-Traditional Agents Defense, will merge into this Project starting in FY21.

Individual efforts in this project include:

- 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.
- Non-Traditional Agent (NTA) Defense includes chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) Bacterial Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate potential therapeutic compounds effective against bacterial threat agents.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue multiple efforts to advance candidate therapeutics, with a focus on non-traditional candidates, through preclinical evaluation toward IND and phase I clinical studies. File IND for a novel orally-delivered therapeutic for treatment of B. pseudomallei infection.</li> <li>- Continue strategy to engage industry in the development of therapeutics for Biowarfare agent 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.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue multiple efforts to identify and advance candidate therapeutics, with a focus on non-traditional candidates, through preclinical evaluation toward IND and phase I clinical studies.</li> </ul>	14.479	12.058	12.067

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Expand layered defense against bacterial threats that evaluates the combination of vaccination with antibiotic therapy, as well as promising monoclonal antibodies and nontraditional therapeutics. Utilizing flexible and agile acquisition vehicles, partner with interagency and industry to develop nonclinical biodefense efficacy packages for therapeutic assets in advanced development.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>				
<p><b>Title:</b> 2) Bacterial/Toxin Vaccines</p> <p><b>Description:</b> Evaluate the best single agent bacterial and toxin vaccines and pretreatments for effectiveness against aerosol challenge in large animal models.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete nonclinical efficacy and toxicology of Burkholderia OMV vaccine and subunit vaccine for advancement to clinical phase I.</li> <li>- Continue to complete IND enabling efforts and filings in support of human clinical trials for animal-rule licensure of the multivalent monoclonal antibody cocktail for protection against A and B serotypes of botulinum neurotoxin.</li> <li>- Continue IND enabling development of live-attenuated tularemia vaccine.</li> <li>- Continue evaluation of efficacy and capsule conjugate manufacturing process development and formulation for next generation anthrax vaccine in combination with Protective-antigen (PA)-based vaccine.</li> <li>- Continue to refine correlates of immunity of next generation CPS conjugate anthrax vaccine.</li> <li>- Continue Burkholderia and Q fever seroprevalence studies in support of potential clinical trials, reagent generation and biomarker discovery.</li> <li>- Initiate Phase 1 clinical trial for multivalent monoclonal antibody cocktail.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete manufacturing and release of Burkholderia OMV vaccine and subunit vaccine for initiation of a phase I clinical.</li> <li>- Complete IND enabling efforts and filings in support of human clinical trials for animal-rule licensure of the multivalent monoclonal antibody cocktail for protection against A and B serotypes of botulinum neurotoxin.</li> <li>- Continue IND enabling development of live-attenuated tularemia vaccine.</li> <li>- Initiate manufacturing of capsule conjugate manufacturing process development and formulation for next generation anthrax vaccine in combination with Protective-antigen (PA)-based vaccine.</li> <li>- Complete correlates of immunity and down selection of next generation CPS conjugate anthrax vaccine.</li> <li>- Continue seroprevalence studies in support of potential clinical trials, reagent generation and biomarker discovery.</li> <li>- Complete phase 1 clinical trial for multivalent monoclonal antibody cocktail for transition.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		18.382	14.518	17.342

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Increase due to change in program/project technical parameters.				
<p><b>Title:</b> 3) 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 Facility (MCM-ADM) to support establishment of platform capabilities as enablers of the advanced development of CBDP medical countermeasure products. These initiatives will lead to the development of multi-use platforms that have the potential to accelerate medical product development and/or regulatory approval as well as reduce overall development costs.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Fund monoclonal antibodies technologies to counter threat agents both prophylactically and therapeutically.</li> <li>- Fund novel expression systems, including outer membrane vesicle based bacterial expression platforms for bacterial vaccine candidates.</li> <li>- Fund novel platform technologies to support medical countermeasure candidate development, including the conjugate polysaccharide based vaccine platform, live attenuated bacteria, subunit vaccines and the DNA vaccine platform.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue to fund monoclonal antibodies technologies to counter threat agents both prophylactically and therapeutically.</li> <li>- Continue to fund novel expression systems, including rapid manufacturing systems.</li> <li>- Continue expansion of outer membrane vesicle based bacterial expression platforms for bacterial vaccine candidates.</li> <li>- Continue to fund novel platform technologies to support rapid medical countermeasure candidate development, including prospective candidate DNA banking, additional cell line development.</li> <li>- Continue the advancement of the conjugate polysaccharide based vaccine platform, live attenuated bacteria, subunit vaccines and the DNA vaccine platform.</li> <li>- Fund technologies that support regulatory science.</li> <li>- Continue to fund animal model development to support, test, and evaluate MCMs and the capability to respond to emerging threats.</li> <li>- Support manufacturing advancements for biologics.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		-	20.900	21.281
<p><b>Title:</b> 4) 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-</p>		2.280	6.358	7.620

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Down select and qualify biomarkers of nonlethal alphavirus disease in NHPs.</li> <li>- Continue assay development to qualification/validation for advanced studies.</li> <li>- Continue manufacturing development of OMV and nanoparticle vaccine platforms targeting Burkholderia, Francisella and Yersinia.</li> <li>- Initiate assay qualification for OMV vaccine in advance of clinical studies.</li> <li>- Continue development of native conformation membrane protein expression and presentation system.</li> <li>- Initiate manufacturing and development of next generation plague monoclonal antibody cocktail.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Initiate nonclinical and manufacturing development VSV-based MARV and multivalent filovirus vaccine.</li> <li>- Identify biomarkers of nonlethal alphavirus disease in NHPs.</li> <li>- Continue assay development to qualification/validation for advanced studies.</li> <li>- Continue manufacturing development of OMV and nanoparticle vaccine platforms targeting Francisella, Yersinia and Q Fever.</li> <li>- Complete assay qualification for OMV vaccine in advance of clinical studies.</li> <li>- Continue development of native conformation membrane protein expression and presentation system.</li> <li>- Continue manufacturing and nonclinical development of next generation plague and tularemia monoclonal antibody cocktail.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters.</p>			
<p><b>Title:</b> 5) Viral Therapeutics</p> <p><b>Description:</b> Identify, optimize and evaluate potential therapeutic candidates effective against designated viral threat agents.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue small molecule and monoclonal antibody selection and evaluation in NHP models for pan-ebola/pan-filovirus and alphaviral therapeutic applications.</li> <li>- Continue joint development of pan-marburg monoclonal antibody development with interagency partners.</li> <li>- Continue monoclonal antibody development for broad spectrum capabilities.</li> <li>- Continue developing core capabilities for NHP studies.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- File an IND for the small molecule ribonucleoside viral replication inhibitor directed against alphaviruses (VEEV).</li> </ul>	7.508	15.375	15.393

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>		<b>FY 2021</b>
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<ul style="list-style-type: none"> <li>- Continue small molecule and monoclonal antibody selection and evaluation in NHP models for pan-ebola/pan-filovirus and alphaviral therapeutic applications.</li> <li>- Continue joint development of pan-Marburg monoclonal antibody with interagency partners.</li> <li>- Continue monoclonal antibody cocktail development for broad spectrum capabilities.</li> <li>- Begin studies on reducing neuro-inflammation by repurposing existing therapeutics.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>				
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<p><b>Title:</b> 6) Viral Vaccines</p> <p><b>Description:</b> Evaluate 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 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue assay qualification and validation for Ebola virus, Marburg virus, and alphavirus vaccines.</li> <li>- Continue formulation development of adjuvanted DNA Alphavirus vaccine and initiate efficacy studies in animal models.</li> <li>- Continue development of rVSV and DNA Marburg virus vaccines.</li> <li>- Continue evaluation of arenavirus vaccines in animal models.</li> <li>- Continue evaluation of rVSV Ebola vaccine duration of protection assessment.</li> <li>- Initiate stability and in vitro delivery studies of alphavirus DNA vaccine formulations.</li> <li>- Initiate evaluation of Filovirus aerosol pathology.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue assay qualification and validation for Ebola virus, Marburg virus, and alphavirus vaccines.</li> <li>- Continue formulation and manufacturing development of adjuvanted DNA Alphavirus vaccine</li> <li>- Continue evaluation of immunogenicity and protection studies DNA alphavirus vaccines in animal models.</li> <li>- Continue development of rVSV and DNA Marburg virus vaccines.</li> <li>- Continue evaluation of arenavirus vaccines in animal models.</li> <li>- Continue evaluation of rVSV Ebola vaccine duration of protection assessment.</li> <li>- Continue in vitro delivery studies of alphavirus DNA vaccine formulations.</li> <li>- Continue evaluation of Filovirus aerosol pathology.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	5.592	9.401		11.267
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Increase due to change in program/project technical parameters.			
<p><b>Title:</b> 7) Medical Diagnostics</p> <p><b>Description:</b> Investigate medical diagnostics that are agnostic against chemical and biological threats (including NTAs, pharmaceutical-based agents, and toxins) by advancing diagnostic innovations; investigating emerging technologies; ensuring medical diagnostics rapid adaptation to emerging threats; develop prototypes and tools that advance medical diagnostics towards FDA approval.</p> <p><b>FY 2020 Plans:</b> Biological:</p> <ul style="list-style-type: none"> <li>- Complete development of rapid quantitative in-situ protein and gene expression platform technologies for host response.</li> <li>- Continue effort to develop and validate a lateral flow immunoassay prototype for Burkholderia and Plague.</li> <li>- Complete optimization and enhancement of updated bioinformatics platform to support genomic and clinical (biomedical) informatics modularity.</li> <li>- Continue development of computational tools to include artificial intelligence tools for biological assay development.</li> <li>- Continue multi-echelon diagnostic testing and assessments of novel point of need medical diagnostics in low resource settings and austere environments.</li> <li>- Continue to optimize agnostic pathogen discovery and/or detection in clinical samples.</li> <li>- Continue incorporation of stability and pre-clinical studies for diagnostic assays in development to further support FDA pre-Emergency Use Authorization (pre-EUA) submissions.</li> <li>- Continue developing point-of-need diagnostic platforms with host biomarker diagnostic assays and testing performance.</li> <li>- Continue effort with Republic of Korea (RoK) on new Project Agreement to develop diagnostic platforms against biological threat agents of interest on the Korean peninsula.</li> <li>- Continue the development of the In-vitro Affinity Diagnostic System (IADS) platform that will complement the currently fielded molecular-based diagnostics system.</li> <li>- Continue prototype development for integrated platforms that identify antimicrobial resistance and perform antimicrobial susceptibility testing.</li> <li>- Continue developing and validating diagnostics for host-based biomarkers to guide therapeutic intervention at the earliest possible stage after infection; thus preventing the onset of serious systemic complications, and/or aiding in appropriate antimicrobial stewardship to prevent further multi-drug resistance infections.</li> </ul> <p>Chemical:</p> <ul style="list-style-type: none"> <li>- Transition diagnostic platform prototype to diagnose chemical exposure to nerve agents.</li> </ul> <p><b>FY 2021 Plans:</b></p>	36.842	29.056	28.824

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Biological:</p> <ul style="list-style-type: none"> <li>- Obtain FDA approval for lateral flow immunoassay for Burkholderia and Plague.</li> <li>- Continue development of computational tools to include artificial intelligence tools for biological assay development.</li> <li>- Continue multi-echelon diagnostic testing and assessments of novel point of need medical diagnostics in low resource settings and austere environments.</li> <li>- Continue to optimize agnostic pathogen discovery and/or detection in clinical samples.</li> <li>- Continue incorporation of stability and pre-clinical studies for diagnostic assays in development to further support FDA pre-Emergency Use Authorization (pre-EUA) submissions.</li> <li>- Continue developing point-of-need diagnostic platforms with host biomarker diagnostic assays and testing performance.</li> <li>- Continue effort with RoK on new Project Agreement to develop diagnostic platforms against biological threat agents of interest on the Korean peninsula.</li> <li>- Continue the development of the IADS platform that will complement the currently fielded molecular-based diagnostics system.</li> <li>- Continue prototype development for integrated platforms that identify antimicrobial resistance and perform antimicrobial susceptibility testing.</li> <li>- Continue developing and validating diagnostics for host-based biomarkers to guide therapeutic intervention at the earliest possible stage after infection; thus preventing the onset of serious systemic complications, and/or aiding in appropriate antimicrobial stewardship to prevent further multi-drug resistance infections.</li> </ul> <p>Chemical:</p> <ul style="list-style-type: none"> <li>- Continue effort of transition diagnostic platform prototype to diagnose chemical exposure to nerve agents.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 8) Chemical Therapeutics</p> <p><b>Description:</b> Focuses on pretreatment and post treatment strategies to effectively minimize injuries resulting from exposure to CWAs. This effort involves the development of neuroprotectants, anticonvulsants, and improved therapies for brain enzyme reactivation. Supports eventual FDA licensure of new compounds or to identify licensed products for use in the treatment of chemical warfare casualties.</p> <p><b>FY 2020 Plans:</b></p> <ul style="list-style-type: none"> <li>- Complete proof-of-concept in vivo experiments to measure neuroprotective effects of known and novel compounds.</li> <li>- Continue using real-time microdialysis system to support therapeutic candidate analysis and development.</li> </ul>	1.630	2.360	15.841

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>- Continue advanced pre-clinical development of lead therapeutic candidates.</p> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue using real-time microdialysis system to support therapeutic candidate analysis and development.</li> <li>- Continue advanced pre-clinical development of lead therapeutic candidates.</li> <li>- Continue efforts to develop OPNA catalytic scavenger enzymes in support of investigational new drug (IND) submission to the FDA.</li> <li>- Continue prophylactic studies of Medical Countermeasures (MCMs) against additional selected NTAs and continue efforts as needed.</li> <li>- Continue investigating technologies for delivering therapeutics to the brain.</li> <li>- Continue optimizing and evaluating novel therapeutic in animal models and initiate preclinical studies in support of investigative new drug (IND) submission.</li> <li>- Continue drug repurposing effort to identify therapeutics for selected NTAs.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. RDT&amp;E Project NT3, Techbase Non-Traditional Agents Defense, will merge into this program starting in FY21.</p>			
<p><b>Title:</b> 9) Medical Diagnostics Response Capability Development</p> <p><b>Description:</b> Investigate medical diagnostics ubiquitous and comprehensive against chemical and biological threats (including) NTAs, pharmaceutical-based agents, and toxins) by advancing diagnostic innovations Support diagnostics capability and prototype development to allow for rapid response to emerging threats by investing into DoD core lab capabilities.</p> <p><b>FY 2020 Plans:</b> Biological:</p> <ul style="list-style-type: none"> <li>- Continue efforts to integrate or converge platform technologies to detect antimicrobial resistance/multidrug resistance (AMR/MDR) and pathogen identification into one platform.</li> <li>- Initiate the advancement of next-generation sequencing for use as a medical diagnostic capability with the goal of developing the first FDA pre-Emergency Use Authorization (pre-EUA) diagnostic assay utilizing this approach.</li> <li>- Initiate additional prototypes and accelerate assessment of In Vitro Affinity Diagnostic System (IADS) platforms addressing gaps in intracellular biological pathogens and toxins.</li> </ul> <p>Chemical:</p> <ul style="list-style-type: none"> <li>- Initiate diagnostics capability to support Defense Laboratory Network (DLN) efforts against chemical warfare agent exposure.</li> </ul> <p><b>FY 2021 Plans:</b></p>	-	10.500	8.194

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 Medical Defense (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Biological:</p> <ul style="list-style-type: none"> <li>- Continue efforts to integrate or converge platform technologies to detect antimicrobial resistance/multidrug resistance (AMR/MDR) and pathogen identification into one platform.</li> <li>- Continue the advancement of next-generation sequencing for use as a medical diagnostic capability.</li> <li>- Continue the development and assessment of In-vitro Affinity Diagnostic System (IADS) prototypes for future application within a rapid response capability addressing gaps in intracellular biological pathogens and toxins.</li> </ul> <p>Chemical:</p> <ul style="list-style-type: none"> <li>- Continue diagnostics capability to support Defense Laboratory Network (DLN) efforts against chemical warfare agent exposure.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	86.713	120.526	137.829

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB4: Medical Biological Defense (ACD&P)	63.783	46.166	47.727	-	47.727	37.689	42.517	31.436	35.462	Continuing	Continuing
• MC4: Medical Chemical Defense (ACD&P)	3.685	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.685
• MB5: Medical Biological Defense (SDD)	127.933	130.074	86.460	-	86.460	56.868	45.226	68.593	83.282	Continuing	Continuing
• MC5: Medical Chemical Defense (SDD)	43.648	60.220	54.392	-	54.392	52.813	31.441	15.215	15.019	Continuing	Continuing
• MB7: Medical Biological Defense (Op Sys Dev)	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 / Technology Transition (ATD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TT3: <i>Technology Transition (ATD)</i>	-	9.577	10.982	10.416	-	10.416	10.121	9.842	9.540	9.540	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 to significantly improve Warfighter capabilities in preparation for transition of mature chemical and biological (CB) defense technologies to advanced development programs. This project addresses the three primary chemical and biological defense thrust areas of Assess, Protect, and Mitigate with an emphasis on Integrated Early Warning (IEW) and Integrated Layered Defense (ILD). IEW is conducted through a coordinated program approach focused on layering chemical and biological detection technologies and integrating CB threat indicators, providing a combination of awareness and understanding that facilitates effective decision making so the force can continue military operations and achieve mission success in a CBRN environment. The ILD achieves solutions for capability gaps across medical and non-medical commodity areas to enable warfighter survival and rapid recovery in a CBRN environment.

Individual efforts in this project include:

- Programs that offer the opportunity to identify and efficiently mature emerging technologies, reduce risks, and finalize engineering and integration efforts.
- Programs that 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.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Experiment & Technology Demonstrations	9.577	10.982	10.416
<b>Description:</b> Utilize Technology Concepts, Early User Assessments, and Advanced Technology Demonstrations (ATDs) to demonstrate the maturity and potential of advanced technologies across the Assess, Protect, and Mitigate spectrum for enhanced military operational capability and technology transition effectiveness.			
<b>FY 2020 Plans:</b>			
- Continue situational understanding at the tactical level and initiate situational understanding at the operational level for the comprehensive IEW ATD.			
- Continue S&T integration activities for CB sensor technologies onto mobile platforms and transition to advanced development as part of the second phase of the comprehensive early warning ATD, to be integrated into CBRN Sensor Integration on Robotic Platforms (CSIRP) efforts.			
- Demonstrate integration of wearable sensors as part of the comprehensive early warning ATD.			
- Demonstrate service specific prototype end-to-end early warning capability.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Technology Transition (ATD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<ul style="list-style-type: none"> <li>- Continue transition activities with advanced development and associated JPM program efforts supporting the CBDP IEW focus area.</li> <li>- Continue to conduct Early User Assessments with Warfighters to assess early technology capability contributions to operational missions, in collaboration with the CBDP Joint Combat Developer.</li> <li>- Continue Technology Concept activities in support of Integrated Early Warning and Integrated &amp; Layered Defense.</li> </ul> <p><b>FY 2021 Plans:</b></p> <ul style="list-style-type: none"> <li>- Continue situational understanding at the tactical level and initiate situational understanding at the operational level for the comprehensive IEW ATD.</li> <li>- Continue S&amp;T integration activities for CB sensor technologies onto mobile platforms and transition to CBRN Sensor as part of the second phase of the comprehensive early warning ATD, to be integrated into CSIRP efforts.</li> <li>- Continue to demonstrate integration of wearable sensors as part of the comprehensive early warning ATD.</li> <li>- Continue to demonstrate service specific prototype end-to-end early warning capability.</li> <li>- Continue transition activities with advanced development and associated JPM program efforts supporting the CBDP IEW focus area.</li> <li>- Continue to conduct Early User Assessments with Warfighters to assess early technology capability contributions to operational missions, in collaboration with the CBDP Joint Combat Developer.</li> <li>- Continue Technology Concept activities in support of IEW and ILD.</li> </ul> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	9.577	10.982	10.416

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TT4: Technology Transition (ACD&P)	0.000	0.000	0.577	-	0.577	0.866	1.143	1.443	1.443	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	115.452	80.162	76.167	-	76.167	70.953	84.263	71.189	74.083	Continuing	Continuing
CA4: <i>Contamination Avoidance (ACD&amp;P)</i>	-	30.879	19.074	10.326	-	10.326	9.853	17.868	14.727	14.294	Continuing	Continuing
DE4: <i>Decontamination (ACD&amp;P)</i>	-	6.819	7.235	6.286	-	6.286	8.984	12.865	9.034	7.487	Continuing	Continuing
IP4: <i>Individual Protection (ACD&amp;P)</i>	-	3.172	1.997	2.483	-	2.483	3.487	0.000	4.682	8.946	Continuing	Continuing
IS4: <i>Information Systems (ACD&amp;P)</i>	-	0.821	0.528	4.661	-	4.661	4.257	4.052	4.048	3.852	Continuing	Continuing
MB4: <i>Medical Biological Defense (ACD&amp;P)</i>	-	63.783	46.166	47.727	-	47.727	37.689	42.517	31.436	35.462	Continuing	Continuing
MC4: <i>Medical Chemical Defense (ACD&amp;P)</i>	-	3.685	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.685
TE4: <i>Test &amp; Evaluation (ACD&amp;P)</i>	-	6.293	5.162	4.107	-	4.107	2.822	2.823	2.824	1.601	Continuing	Continuing
TM4: <i>Techbase Medical Defense (ACD&amp;P)</i>	-	0.000	0.000	0.000	-	0.000	2.995	2.995	2.995	0.998	Continuing	Continuing
TT4: <i>Technology Transition (ACD&amp;P)</i>	-	0.000	0.000	0.577	-	0.577	0.866	1.143	1.443	1.443	Continuing	Continuing

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

The projects in this program element (PE) support technology, engineering, integration, and life-cycle cost risk reduction activities (e.g. component development, prototyping, and experimentation) prior to Milestone B.

Individual projects include:

- Contamination Avoidance (CA4): development of reconnaissance, detection, identification, and hazard prediction equipment, hardware, and software that minimize Chemical, Biological, Radiological (CBR) contamination and prevent further cross-contamination during operations.

- Decontamination (DE4): development of Contamination Mitigation (ConMit) systems utilizing solutions that will remove and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>	
<p>- Individual Protection (IP4): development of the next generation protective ensembles (e.g., suits, boots, and gloves) which enable the Joint Force to survive and continue the mission in CBR contaminated environments.</p> <p>- Information Systems (IS4): component development and prototyping of information architectures and applications for shaping the battlespace and providing integrated early warning against Chemical, Biological, Radiological, and Nuclear (CBRN) threats.</p> <p>- Medical Biological Defense (MB4): development of medical countermeasure platform technologies, medical countermeasures (vaccines and therapeutics), reagents, assays, and diagnostic equipment to provide an effective capability for medical defense against biological warfare agent threats facing U.S. Forces in the field.</p> <p>- Medical Chemical Defense (MC4): development of medical materiel and other medical equipment items (e.g., diagnostic equipment, prophylactic, pre-treatment, and therapeutic drugs, and individual/casualty decontamination compounds) necessary to provide an effective capability for medical defense against chemical warfare agent threats facing U.S. Forces in the field.</p> <p>- Test and Evaluation (TE4): critical test capabilities, planning, and infrastructure improvements/modifications necessary to evaluate CBRN Defense systems in realistic operating environments.</p> <p>- Techbase Medical Defense (TM4): reduces risk and establishes safety and tolerability for vaccines prior to transition to System Development &amp; Demonstration.</p> <p>- Technology Transition (TT4): validates high-risk/high-payoff technologies and their respective concepts-of-operations for significant improvement to Warfighter capabilities in preparation for transition of mature technologies to advanced development programs requiring chemical and biological (CB) defense technologies. This effort facilitates transitions of Integrated Early Warning and Integrated Layered Defense products.</p> <p>The projects in this PE support the advanced component technology development phase of the DoD acquisition system and are therefore correctly placed in Budget Activity 4.</p>		

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	115.886	83.662	101.792	-	101.792
Current President's Budget	115.452	80.162	76.167	-	76.167
Total Adjustments	-0.434	-3.500	-25.625	-	-25.625
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	0.000	-3.500			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.434	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-25.625	-	-25.625

**Change Summary Explanation**

Funding: FY19 (-\$0.434 Million): Reprogramming adjustments to balance overall portfolio efforts.

FY20 (-\$3.500 Million): Congressional Directed Reductions to the Mass Personnel Decontamination and Venezuelan Equine Encephalitis programs.

FY21 (-\$25.625 Million): Decreases due to unfunding the Filovirus Vaccine and Venezuelan Equine Encephalitis Vaccine programs (-\$20.542 Million), the Defense-Wide Review (DWR) reductions to account for programs being terminated or restructured (-\$5.016 Million), and Departmental economic adjustments (-\$0.067 Million).

Schedule: N/A

Technical: Provides for critical new start programs, Service Equipment Decontamination System (SEDS) and CBRN Covers, Coatings and Protective Overlays (C3PO).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CA4: Contamination Avoidance (ACD&P)	-	30.879	19.074	10.326	-	10.326	9.853	17.868	14.727	14.294	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 reconnaissance, detection, identification, and hazard prediction equipment, hardware, and software.

Efforts included in this project are:

- (1) Compact Chemical Vapor Agent Detector- CVCAD (formerly Wearable Chemical Agent Detector- WCAD)
- (2) Biosurveillance (BSV)
- (3) Chemical Biological Radiological and Nuclear (CBRN) Sensor Integration on Robotics Platforms (CSIRP)
- (4) Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets (CBRN DRS)
- (5) Enhanced Capability Demonstration Integrated Early Warning (ECD IEW)
- (6) Enhanced Capability Demonstration Joint Chemical Biological Radiological Nuclear Advanced Capability Sets (ECD JCACS)
- (7) Non-Traditional Agent (NTA) Defense, and
- (8) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA).

The CVCAD formerly known as WCAD is designed to be an unobtrusive, low-profile chemical detection capability that will continuously, and autonomously, monitor and alert general and specialized units to an unsafe environment without further burdening the warfighters payload or interfering with the primary mission. The small form factor is amenable to both man-worn and unmanned aerial or unmanned ground systems operations in order to enable timely personnel protective action and other force protection decisions.

BSV efforts 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. BSV will address medical and physical CBRN mission needs spanned in over eleven requirements documents and through Combatant Commander (COCOM) identified needs. BSV supports the Capabilities to Enable NBC Threat Awareness, Understanding, and Response (CENTAUR) effort, and immediate operational needs, 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. CENTAUR serves as the baseline configuration for ECD IEW which will be renamed CBRN IEW and merged to RDT&E Project IS4, Information Systems in FY21.

CSIRP is a prototyping and fielding effort that will focus on repackaging and integrating modular CBRN sensor solutions to enhance Unmanned Air Systems (UAS) and Unmanned Ground Systems (UGS) Programs of Record (PORs) to provide situational awareness across the echelons of command in order to enable freedom of maneuver and action on the battlefield. An integrated CSIRP capability will exploit advances in machine learning and autonomy, sensing and communication

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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> <i>CA4 / Contamination Avoidance (ACD&amp;P)</i>
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capabilities that enable timely and accurate detection, warning and reporting of CBRN hazards for increased risk reduction opportunities at tactical and operational echelons in mounted and dismounted configurations. CSIRP gives the Joint Force an opportunity to enhance capabilities and maintain operational advantage in a lethal and sophisticated operating environment.

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 CBRN DRS will provide an Advanced Capabilities Set to meet emerging requirements for the follow-on technical forces to conduct more in-depth dismounted CBRN reconnaissance, sensitive site assessment, characterization of WMD/hazardous materials, events, or accidents, and sensitive site exploitation/elimination. The Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets Advanced Capability Set will provide more sensitive and reliable detection and identification of CBRN threats, enhanced personal protective equipment (PPE) for longer duration missions, and increased situation awareness through networked communications of the hazard. The CBRN DRS configurations will be tailored to meet individual Service mission tasks. The technology upgrade and refresh effort for CBRN DRS transitions from CA4 to CA7 for implementation starting in FY20.

The ECD IEW will integrate advanced technologies and currently fielded capabilities into a common architecture with situational understanding decision tools to facilitate effective (timely) decision making, so the force can continue military operations or assist partners or civilians in a Chemical Biological Radiological and Nuclear (CBRN) environment. The Joint Force requires tactical, enhanced, and CBRN detection, protection, contamination mitigation, contamination characterization, situational awareness, and hazard understanding early warning capability and decision tools to provide operational commanders time, space, and confidence for decisions that enable mission success. ECD IEW will demonstrate these capabilities by focusing on the complex integration of currently disconnected and disparate battlefield systems to enable a Joint Integrated Early Warning Capability for all phases of operations.

The ECD JCACS demonstrated new technologies to enhance the ability of 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. In FY20, ECD JCACS will focus on the use of robotics to enhance these missions. FY20 is the last year of funding and the ECD JCACS robotics efforts will transition over to CSIRP in FY21.

NTA Defense program works with the Joint Services, interagency, and international partners to focus RDT&E resources to determine readiness against Pharmaceutical Based Agents (PBA) and other emerging threats. Program provides support to the CBDP Enterprise by assessing technology and equipment to enable rapid fielding options for all users.

The ROSETTA is a modernization effort to provide a higher confidence chemical liquid hazard detection ticket in the currently fielded M256A2 kit for the Warfighter to make timely decisions. These decisions will reduce casualties and improve the combat effectiveness of troops engaged in conflicts involving the use of chemical warfare agents. ROSETTA is based on colorimetric technology and will be eye-readable. In addition, the ROSETTA ticket will provide improved hazard detection performance with reduced false alarm rate, potential for increased number of chemicals detected, reduced detection time especially for certain compounds of interest, and potential for integration onto unmanned platforms especially micro-sized unmanned aerial sensors. In FY20, ROSETTA will be testing vendor prototypes to develop technical data packages using BA5 funding.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Wearable Chemical Agent Detector (WCAD) <b>Description:</b> Program Management and Technology Assessment		0.426	-	-
<b>Title:</b> 2) Compact Vapor Chemical Agent Detector (CVCAD) <b>Description:</b> Contract control activities  <b>FY 2021 Plans:</b> Leverage existing Other Transactional Authority (OTA) contracts to support Milestone (MS) A award, and conduct early user feedback event to inform form, fit, and function of early prototypes, and conduct a test bed assessment against draft requirements.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project schedule. Program name changed from WCAD to CVCAD starting in FY21. Transition from Techbase in FY21.		-	-	0.996
<b>Title:</b> 3) Biosurveillance (BSV) <b>Description:</b> Capabilities to Enable NBC Threat Awareness, Understanding, and Response (CENTAUR)  <b>FY 2020 Plans:</b> Complete CENTAUR efforts. Transition residual capabilities to support Enhanced Capability Demonstration Integrated Early Warning (ECD IEW) and programs of record within the enterprise (Joint Biological Tactical Detection System (JBTDS), Next Generation Diagnostic System (NGDS), Enhanced Maritime Biological Detection (EMBD)).  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed.		6.866	0.397	-
<b>Title:</b> 4) BSV <b>Description:</b> CENTAUR residual capability and operational demonstration test support		3.500	-	-
<b>Title:</b> 5) CBRN Sensor Integration on Robotic Platforms (CSIRP) <b>Description:</b> Product Development, Program Management, Support, Testing and Evaluation  <b>FY 2020 Plans:</b> Continue sensor integration efforts for unmanned ground and air platforms, and mission modeling efforts. Continue size, weight, and power trade studies for sensor integration. Purchase upgraded developmental test articles. Continue unmanned technology demonstrations and providing support to test events requiring robotic platforms. Coordinate additional demonstrations by new		4.804	7.987	4.061

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>prototype vendors and end users evaluating the capabilities, reliability and usability of the integrated sensors onto the Unmanned Air Systems (UAS) and Unmanned Ground Vehicles (UGV).</p> <p><b>FY 2021 Plans:</b> Continue multiple sensor integration efforts for unmanned ground and air platforms. Initiate market studies on sensor and platform technology for next cycle of prototypes. Continue Program Management including government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project schedule. CSIRP will continue efforts on robotic integration.</p>				
<p><b>Title:</b> 6) CBRN Dismounted Reconnaissance Sets (CBRN DRS)</p> <p><b>Description:</b> Provide Chemical Biological Radiological and Nuclear (CBRN)DRS Advanced Capability Set (ACS) market assessment and requirement decomposition to assist capability developers in scoping requirements. Efforts include decomposing requirements into performance parameters and specifications, assessing the commercial market, and procuring and testing candidates as required.</p>		0.480	-	-
<p><b>Title:</b> 7) Enhanced Capability Demonstration Integrated Early Warning (ECD IEW)</p> <p><b>Description:</b> Early Warning common CBRN architecture development and capability integration.</p> <p><b>FY 2020 Plans:</b> Demonstrate Early Warning capability integration for remote CBRN and Non-CBRN sensors and decision support and deploy prototypes to operational unit for experimentation and feedback.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. This program will merge to RDT&amp;E Project IS4, Information Systems (CBRN IEW) starting in FY21.</p>		2.882	2.975	-
<p><b>Title:</b> 8) ECD IEW</p> <p><b>Description:</b> Early Warning capability RDT&amp;E test article procurement and assessment.</p> <p><b>FY 2020 Plans:</b> Complete Early Warning capability RDT&amp;E test article procurement and assessment for fixed site operational units.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		0.750	0.500	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. This program will merge to RDT&E Project IS4, Information Systems (CBRN IEW) starting in FY21.				
<p><b>Title:</b> 9) ECD Joint CBRN Advanced Capability Sets (ECD JCACS)</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Complete integration efforts for unmanned air and ground platforms, complete mission modeling efforts. Complete size, weight and power trade studies on sensor integration.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed.</p>		6.955	1.358	-
<p><b>Title:</b> 10) ECD JCACS</p> <p><b>Description:</b> Program Management, Support, Test and Evaluation</p> <p><b>FY 2020 Plans:</b> Complete Program Management support including Government system engineering, program/financial management, costing, personnel labor, travel and overhead. Initiate and complete test and demonstrations of sensors on unmanned air and ground platforms.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed.</p>		1.087	0.565	-
<p><b>Title:</b> 11) Non-Traditional Agent (NTA) Defense</p> <p><b>Description:</b> NTA Defense program provides assessment and improvement of detection, protection, and decontamination capabilities to protect the Joint Services against emerging threats, with current focus on Pharmaceutical Based Agents (PBAs). Specific efforts include: assessment of technologies and prototyping for rapid fielding to the Joint Services; and sharing of classified and unclassified data, information, and knowledge regarding PBAs. Efforts seek to minimize duplication of effort and maximize cost-sharing opportunities across the whole of government and with international partners.</p> <p><b>FY 2020 Plans:</b> Continue leverage expanded requirements to broaden data set for PBAs. Produce additional data to fully assess capabilities against new requirements and inform rapid fielding decisions. Develop/assess/publish enhanced techniques for sample collection/</p>		2.528	5.292	5.269

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
preparation and decontamination against PBAs. Expand classified NTA Data Library and For Official Use Only (FOUO) PBA data portal with newly available data to ensure widest dissemination possible.  <b>FY 2021 Plans:</b> Continue to leverage expanded requirements to broaden data set for PBAs. Produce additional data to better assess detection and decontamination capabilities against new requirements and inform rapid fielding decisions. Conduct a table top exercise and field exercise to support Joint Service and interagency tactics, techniques, and procedures (TTP) development. Expand classified NTA Data Library with newly available data to ensure widest dissemination possible. Implement new data management plan. Initiate new market surveys and assessments of technologies for rapid fielding of Chemical Biological Defense Program (CBDP) capabilities, focused on emerging priority threats. Invest in technology prototyping and assessment to provide capability improvements.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters.			
<b>Title:</b> 12) NTA Defense support for Threat Agent Characterization  <b>Description:</b> The International Novel Threat Agent Characterization Trials (INTACT) effort is a series of laboratory and field experiments to characterize the properties of emerging chemical threats and assess potential capabilities against those emerging threats in an operationally-realistic manner. INTACT is a collaboration with other CBDP partners, as well as with other nations, under the Chemical Biological Radiological Memorandum of Understanding (CBR MOU).	0.125	-	-
<b>Title:</b> 13) ROSETTA  <b>Description:</b> Provide system engineering design and program management for Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA).	0.476	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	30.879	19.074	10.326

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• CA5: Contamination Avoidance (SDD)	102.827	127.833	128.954	-	128.954	64.217	32.247	28.065	29.730	Continuing	Continuing
• JF0100: JOINT CHEMICAL AGENT DETECTOR (JCAD)	1.698	2.246	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.944

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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)**

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• MC0100: JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)	0.000	0.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.300
• MC0101: CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)	98.231	58.020	47.393	-	47.393	47.009	66.488	85.905	87.775	Continuing	Continuing
• MX0001: JOINT BIO TACTICAL DETECTION SYSTEM (JBTDs)	0.000	0.000	0.000	-	0.000	17.492	52.290	69.255	84.824	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

WEARABLE CHEMICAL AGENT DETECTOR (WCAD)

WCAD will complete Technology Readiness Evaluation, Modeling & Simulation, Table Top Exercises, and initiate Business Case Analysis efforts to support contractual development for a Milestone A award when program funding restarts. WCAD will continue engagement with Other Government Agency (OGA) stakeholders and industry to inform documentation decisions and program decisions. WCAD was unfunded in FY20, but will restart in FY21 with the new name Compact Vapor Chemical Agent Detector (CVCAD).

COMPACT VAPOR CHEMICAL AGENT DETECTOR (CVCAD)

CVCAD will begin to execute the Other Transactional Agreements (OTA) contracts in FY21 (when funding is first aligned), that were initiated by the Defense Threat Reduction Agency (DTRA) in FY20, to evaluate systems against Warfighter requirements. CVCAD will work closely with the CBRN Sensors Integrated onto Robotic Platforms (CSIRP) in order to transition a lightweight chemical detection capability to CSIRP for Unmanned Aerial Vehicle (UAV) integration. Prior to FY21 the effort was called Wearable Chemical Agent Detector (WCAD); CVCAD will build on the work done under the WCAD.

BIOSURVEILLANCE (BSV)

BSV will utilize residual capabilities from Capabilities to Enable NBC Threat Awareness, Understanding, and Response (CENTAUR). With the Close out of CENTAUR, BSV will transition and integrate successful technologies into a baseline Integrated Early Warning (IEW) framework, to support United States Forces Korea (USFK) & 8th Army's need for environmental monitoring and surveillance, in support of immediate force health protection requirements. Applicable technologies, will be developed, integrated, deployed, operated and sustained, through Other Transaction Agreements (OTA) and procurement contracts. Completion of the effort will serve as a baseline configuration for IEW efforts with in the Chemical Biological Defense Program (CBDP), technologies, lessons learned, test data, will be transitioned to the programs

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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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of record associated with the CBDP (such as Enhanced Capability Demonstration (ECD) IEW, Enhanced Maritime Biological Detection (EMBD), Next Generation Diagnostics System (NGDS), Joint Biological Tactical Detection System (JBTDS) & Common Analytical Laboratory System (CALs)). BSV transitions to CBRN IEW in FY21.

**CBRN SENSOR INTEGRATION ON ROBOTIC PLATFORMS (CSIRP)**

CSIRP is a streamlined acquisition effort to rapidly prototype and field capabilities distinct from the traditional acquisition system. CSIRP will provide unmanned CBRN payload prototypes in 2 year prototyping plan cycles based on service requirements. The prototyping plans will utilize a streamlined acquisition process in order to keep pace with industry and the rapid advancement of technologies. The CSIRP strategy is to utilize the rapid prototyping process enabled by the Other Transactional Agreements (OTA) contract vehicle. Upon award, the awardees will have up to two years to produce prototype CBRN sensors that are integrated onto service chosen (air and/or ground) platforms. These prototypes will be demonstrated, evaluated and tested by the services as well as laboratories and academia. The most successful will be transitioned to the services for the next steps in acquisition, production and eventual fielding across the services. BA4 funding will provide market research to support the refinement and the building of technologically mature prototypes. BA5 funding will provide demonstrations, testing and operational assessments to support transition decisions to POR or sustained capability of the prototypes.

**CBRN DISMOUNTED RECONNAISSANCE SYSTEMS**

The Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Systems (CBRN DRS) will provide more sensitive and reliable detection and identification of CBRN threats, enhanced personal protective equipment (PPE) for longer duration missions, and increased situation awareness through networked communications of the hazard. The program will assess requirements and the market for future technology upgrades and refresh efforts to be transferred to and executed under CA7.

**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 IEW Advanced Capability Demonstration (ATD), and various operational responses to procure developmental equipment and decision support tools 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 through rapid prototyping to a unit to be determined, further requirements development, CBDP program of record insertion, and concepts of employment. ECD IEW transitions to CBRN IEW in FY21.

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

The Enhanced Capability Demonstration (ECD) Joint Chemical Biological Radiological Nuclear Advanced Capability Sets (JCACS) evaluates various equipment during User Feedback Events (UFE) and other test events. The acquisition strategy is to use Other Transactional Agreements (OTAs) and collaborate with CBRN Sensor

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
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Integration onto Robotic Platforms (CSIRP) to acquire the equipment and technical support required. Additionally, JCACS and CSIRP will utilize Government Agencies and Federally Funded Research and Development Centers to provide development, testing and technical support. ECD JCACS will focus on the use and integration of robotics to enhance these missions.

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

The NTA Defense program will transition information, technologies, and capabilities associated with Pharmaceutical Based Agents (PBAs) and other emerging threats into existing and future acquisition programs utilizing a variety of contract mechanisms.

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

ROSETTA will use a streamlined approach. This approach is based on technology that will transition from Science and Technology Efforts and industry. It will be developed using the Countering Weapons of Mass Destruction (CWMD) OTA to award multiple development contracts. The M256A3 Production Contract will use Army Working Capital Funds (AWCF) to purchase the new kits. The ROSETTA funding will complete the development and testing of the new ROSETTA ticket as well as update the currently fielded M256A2 technical data package via an engineering change proposal (ECP) to create a new M256A3 kit that will be available to all Services. The M256A3 kit will replace the M256A2 kit by attrition.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
WCAD - Government SE & Technical Management Team	Various	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.348	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CVCAD - HW C - Transition from DTRA	MIPR	TBD : N/A	0.000	0.000		0.000		0.996	Jan 2021	-		0.996	Continuing	Continuing	0.000
CSIRP - HW C - OPETS Labor	Various	Patricio Enterprises : Inc., Woodbridge, VA	0.000	0.267	Feb 2019	0.000		0.160	Feb 2021	-		0.160	Continuing	Continuing	0.000
CSIRP - HW C - Government Matrix and Core Labor	Various	CCDC CBC : Aberdeen Proving Ground, MD	0.000	1.284	Nov 2018	0.650	Oct 2019	0.437	Dec 2020	-		0.437	Continuing	Continuing	0.000
CSIRP - OTA - Chemical sensor integration onto existing UAV platform	C/FFP	Intelligent Optical Systems (IOS) : Torrance, CA	0.000	0.687	Aug 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Biological sensor integration onto existing UAV platform	C/FFP	FLIR Systems Inc. : Elkridge, MD	0.000	1.000	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - OTA Lead integrator for chemical, and radiological sensors onto existing UAV platforms	C/CPFF	Charles Stark Draper Laboratories : Inc., Cambridge, MA	0.000	0.497	Aug 2019	2.789	Dec 2019	1.493	Dec 2020	-		1.493	Continuing	Continuing	0.000
CSIRP - OTA Lead for Deep Purple UAV fielding	C/CPFF	T2S Solutions (T2S : LLC), Belcamp, MD	0.000	0.616	Aug 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBRN DRS - Non Intrusive Detection Support	Various	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.221	0.441	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - HW C - Product Development	C/CPFF	Charles Stark Draper Laboratories : Inc., Cambridge, MA	3.447	2.300	Mar 2019	1.358	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 C - CSIRP OTA - Multiple Vendors	MIPR	Various : Various	0.000	1.700	Jul 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - HW C - eCSD OTA	MIPR	Smiths Detection : Watford Hertfordshire, UK	0.000	0.500	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - HW C - OGAs and FFRDCs	MIPR	Various : Various	0.000	2.455	Apr 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW C - Capability Assessments	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.329	Dec 2018	0.000		0.150	Mar 2021	-		0.150	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Technology Assessments	MIPR	Various : Various	0.167	0.065	Mar 2019	0.436	Dec 2019	0.202	Jan 2021	-		0.202	Continuing	Continuing	0.000
NTA DEFENSE - NHW S - Threat Understanding and Characterization	MIPR	Various : Various	0.587	0.101	Mar 2019	0.955	Dec 2019	0.100	Jan 2021	-		0.100	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Systems Prototyping and Development	MIPR	Various : Various	0.436	0.477	Jun 2019	0.465	Dec 2019	0.624	Nov 2020	-		0.624	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Strategic Coordination/ Information Management	C/CPFF	Various : Various	0.463	0.190	Dec 2018	0.500	Dec 2019	0.500	Dec 2020	-		0.500	Continuing	Continuing	0.000
NTA DEFENSE - HW S - International Novel Threat Agent Characterization Trials (INTACT)	C/CPFF	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	1.449	0.125	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Government SE & Technical Management Team	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.758	0.526	Dec 2018	1.240	Dec 2019	1.160	Dec 2020	-		1.160	Continuing	Continuing	0.000
<b>Subtotal</b>			7.528	13.908		8.393		5.822		-		5.822	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
WCAD - ES S - MITRE Support	MIPR	USA Research Dev & Engr Cmd (RDECOM) : Aberdeen Proving Ground, MD	0.000	0.014	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - TD/D C -BSP - JACCS/BSP integration development	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	4.587	0.762	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - Assessment of Environmental Detectors	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	9.001	2.246	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - TD/D C - Biological Identification Capability Sets sustainment assays	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	5.910	1.478	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - Early Warning sustainment costs for software package	MIPR	Various : Various	13.986	3.748	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - HW/SW Sensor Interface Design and Concept Development	Various	Various : Various	0.000	0.000		1.550	Feb 2020	0.399	Feb 2021	-		0.399	Continuing	Continuing	0.000
ECD IEW - Acquisition, Integration and decision tool demonstration	C/CPFF	Various : Various	1.355	2.108	Jan 2019	2.175	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - System Integration	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.500	0.200	Jan 2019	0.200	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - ES C - SIL Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.250	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			35.339	10.806		3.925		0.399		-		0.399	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
BSV - DTE S - Developmental Testing, Operational Assessment	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	2.494	0.750	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Testing and Evaluation	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.000		1.800	Mar 2020	0.915	Mar 2021	-		0.915	Continuing	Continuing	0.000
ECD IEW - TTX & OP DEMOs	MIPR	Various : Various	1.000	0.750	Jan 2019	0.500	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - DTE - Test and Evaluation	MIPR	Various : Various	1.689	0.000		0.500	Apr 2020	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Technology Assessments	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.520	Nov 2018	0.436	Jan 2020	0.408	Dec 2020	-		0.408	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Systems Prototyping and Development	MIPR	Various : Various	0.000	0.000		0.466	Jan 2020	1.277	Nov 2020	-		1.277	Continuing	Continuing	0.000
ROSETTA - DTE C - Technology Readiness Assessment	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.250	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			5.183	2.270		3.702		2.600		-		2.600	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
WCAD - PM/MS C - Management Overhead Support	MIPR	Various : Various	0.000	0.064	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
BSV - PM/MS S - BMO Labor & Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	1.481	0.819	Jan 2019	0.236	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
BSV - PM/MS S - ECBC ATD Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.664	0.563	Jan 2019	0.161	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Project Management	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.453	Dec 2018	1.198	Dec 2019	0.657	Dec 2020	-		0.657	Continuing	Continuing	0.000
CBRN DRS - ACS - PM/MS-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.092	0.039	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - ECBC ECD Team	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.348	0.100	Jan 2019	0.100	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - ECBC Matrix Govt labor	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.500	0.233	Jan 2019	0.250	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - Labor and Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.750	0.241	Jan 2019	0.250	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - PM-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	1.353	0.837	Dec 2018	0.065	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
WCAD - WCAD PRE-TMRR	██████████																											
CVCAD - Milestone A											████																	
CVCAD - Milestone B																				████								
BSV - CENTAUR	██████████																											
CSIRP - OTA Request For Information	████																											
CSIRP - Materiel Development Decision			████																									
CSIRP - Request for White Papers - Prototyping Plan #1		████																										
CSIRP - OTA Award for Prototyping Plan #1				████																								
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #1							██████████																					
CSIRP - Demonstration and Transition Decision - Prototyping Plan #1												████																
CSIRP - Request for White Papers - Prototyping Plan #2							████																					
CSIRP - OTA Award for Prototyping Plan #2											████																	
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #2												██████████																
CSIRP - Demonstration and Transition Decision - Prototyping Plan #2																████												
CSIRP - Prototyping Plan #3																██████████												
CBRN DRS - ACS - Materiel Requirements Analysis	██████████																											
CBRN DRS - ACS - Assessment of Potential Solutions			████																									
ECD IEW - ECD IEW Exercises	██████████																											



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
WCAD - WCAD PRE-TMRR	1	2019	4	2019
CVCAD - Milestone A	3	2021	3	2021
CVCAD - Milestone B	3	2023	3	2023
BSV - CENTAUR	1	2019	4	2020
CSIRP - OTA Request For Information	1	2019	1	2019
CSIRP - Materiel Development Decision	3	2019	3	2019
CSIRP - Request for White Papers - Prototyping Plan #1	2	2019	2	2019
CSIRP - OTA Award for Prototyping Plan #1	4	2019	4	2019
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #1	2	2020	4	2021
CSIRP - Demonstration and Transition Decision - Prototyping Plan #1	4	2021	4	2021
CSIRP - Request for White Papers - Prototyping Plan #2	2	2020	2	2020
CSIRP - OTA Award for Prototyping Plan #2	2	2021	2	2021
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #2	3	2021	4	2022
CSIRP - Demonstration and Transition Decision - Prototyping Plan #2	1	2023	1	2023
CSIRP - Prototyping Plan #3	4	2022	4	2024
CBRN DRS - ACS - Materiel Requirements Analysis	1	2019	4	2019
CBRN DRS - ACS - Assessment of Potential Solutions	3	2019	4	2019
ECD IEW - ECD IEW Exercises	1	2019	4	2020
ECD JCACS - Prototype Testing and Assessment	1	2019	4	2019
ECD JCACS - Extended Evaluation	2	2020	4	2020
NTA DEFENSE - Capabilities Assessment	1	2019	4	2025
NTA DEFENSE - Technology Assessments	1	2019	4	2025

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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Events	Start		End	
	Quarter	Year	Quarter	Year
NTA DEFENSE - Strategic Coordination/Information Management	1	2019	4	2025
NTA DEFENSE - Threat Understanding	1	2019	4	2025
NTA DEFENSE - Systems Prototyping and Development	1	2019	4	2025
NTA DEFENSE - International Novel Threat Agent Characterization Trials (INTACT)	1	2019	3	2019
ROSETTA - Engineering Design	1	2019	2	2020

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DE4: <i>Decontamination (ACD&amp;P)</i>	-	6.819	7.235	6.286	-	6.286	8.984	12.865	9.034	7.487	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project supports the development of Contamination Mitigation (ConMit) systems that reduce operational impact and logistics burden, reduce sustainment costs, increase safety, and minimize environmental effects associated with decontamination and contamination mitigation operations. These efforts align with the National Defense Strategy by prioritizing preparedness for war and sustaining Joint Force military advantage and resilient force posture.

Efforts included in this project are:

- (1) CBRN Covers, Coatings and Protective Overlays (C3PO)
- (2) Contaminated Human Remains System (CHRS)
- (3) Mass Personnel Decontamination (MPD)
- (4) Service Equipment Decontamination System (SEDS)
- (5) Tactical Disablement System (TacDS)

The CBRN Covers, Coatings and Protective Overlays (C3PO) program is a FY21 new start with a Family of Systems approach that will provide contamination mitigation capability to critical equipment and assets prior to a Chemical, Biological, Radiological, and Nuclear (CBRN) attack to mitigate the effects and amount of CBRN contamination exposure allowing the Joint Force to be better prepared for war, maintain a resilient force posture, and remain lethal. These capabilities include but are not limited to CBRN protective covers, coatings, paints, and other preventative measures. The program will address capability gaps identified in the ConMit Initial Capabilities Document (ICD), date 11 March 2011 modernizing a key capability.

The Contaminated Human Remains System (CHRS) program will provide a Contaminated Human Remains Transfer Case (CHRT) packaging solution to safely return chemical, biological, or radiological contaminated human remains to the Continental United States. The CHRT is a containment system that will protect personnel from the hazards associated with transporting human remains that are potentially contaminated, without posing additional risk to the handlers or the environment in accordance with federal and international transportation standards. The CHRS program addresses a capability gap identified within the ConMit Initial Capabilities Document (ICD), dated March 2011, for a CHRT packaging solution to safely return chemical, biological, or radiological contaminated human remains to the Continental United States.

The Mass Personnel Decontamination (MPD) program will provide Warfighters with the capability to reduce the hazards associated with mass casualty decontamination efforts for protected and unprotected personnel, casualties and contaminated human remains potentially exposed to CBRN hazards. The program will develop an array of rugged and reliable best-of-breed hardware in a manageably sized, easy to erect, modular system that can be quickly tailored to different Mass Casualty events in order to support decontamination of ambulatory and non-ambulatory patients, and allow for the processing of contaminated human remains. This reduces and limits the spread of contamination among potentially contaminated population groups through a standardized, modular system scalable to increase capability, aligning with the

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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National Defense Strategy by prioritizing preparedness for war in order to remain lethal. The MPD program addresses capability gaps identified within the Consequence Management ICD, dated 14 October 2010, the ConMit ICD, dated 1 March 2011, and the Mortuary Affairs Operations ICD, dated October 2008.

The Service Equipment Decontamination System (SEDS) program is a FY21 new start program that will develop reliable and modular hardware intended to decontaminate military equipment including vehicles, aircraft, personal effects, and weapons to pre-contamination conditions, which sustains Joint Force military advantages and a resilient force posture, building a more lethal Force that aligns with the National Defense Strategy. SEDS will provide contamination mitigation capabilities for hardened, sensitive and/or critical equipment in hostile and non-hostile environments that have been exposed to chemical and biological contamination. The program will address capability gaps identified in the ConMit ICD, date 11 March 2011.

The Tactical Disablement System (TacDS), is a family of systems (FoS) that will provide tactical commanders a suite of products to disable (delay, disrupt, and/or degrade) or defeat (destroy) small quantities of chemical or biological materials of concern (C/BMOC) contained in munitions and bulk containers. The TacDS will operate in locations both remote and accessible, during hostile and non-hostile conditions, and within established time periods, to reduce or eliminate the employability of C/BMOC against the Joint Force and/or prevent state adversaries and non-state actors from acquiring, proliferating, or using weapons of mass destruction, a defense objective in the National Defense Strategy. TacDS addresses capability gaps identified in the ICD for WMD-Defeat (August 2010), ICD for WMD Elimination Analytic Report (March 2013), WMD Disablement ICD (July 2017), and the Sponsor-approved Draft CDD for TacDS FoS (March 2018). The TacDS suite of capabilities will provide a new warfighter capability at the tactical level and play a critical role in DoD's ability to respond effectively to WMD crises and C/BMOC. Two products are currently under development; Product #1, Thermite Bag, a man-portable destruction capability, and Product #2, Epoxy Kit, a delay capability.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) C3PO</p> <p><b>Description:</b> Milestone (MS) A and Prototype Development</p> <p><b>FY 2021 Plans:</b> Initiate Developmental Testing (DT). Conduct MS A, System Readiness Review (SRR), Technology Readiness Assessment (TRA), and Affordability Assessment.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is new start effort in FY 2021.</p>	-	-	1.643
<p><b>Title:</b> 2) CHR5</p> <p><b>Description:</b> CHRT Prototypes and DT</p>	2.495	-	-
<p><b>Title:</b> 3) MPD</p> <p><b>Description:</b> Milestone (MS) A Support and Preliminary Systems Component Testing</p> <p><b>FY 2020 Plans:</b></p>	0.526	3.416	2.867

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (ACD&P)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Award contract to purchase prototype systems components (generators, heat pumps, roller systems, and spray bars) for down select in support of full system Prototype Testing as part of a two-phase prototyping effort. This will inform Developmental Testing in FY21.</p> <p><b>FY 2021 Plans:</b> Conduct Technology Readiness Assessment (TRA) and Manufacturing Readiness Assessment (MRA). Further down select and procure approximately (3) additional prototypes to support Developmental Testing (DT). Complete prototype testing in order to inform Operational Testing (OT) in FY22.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Engineering and Manufacturing Development Phase.</p>			
<p><b>Title:</b> 4) SEDS</p> <p><b>Description:</b> Milestone (MS) A support and Prototype Development</p> <p><b>FY 2021 Plans:</b> Conduct MS A; Initiate contract award to purchase prototype systems for testing. System Readiness Review (SRR), Technology Readiness Assessment (TRA), and Affordability Assessment.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is new start effort in FY 2021.</p>	-	-	1.776
<p><b>Title:</b> 5) TACDS</p> <p><b>Description:</b> Prototype Development and Evaluation</p> <p><b>FY 2020 Plans:</b> Advance programs to logical stopping point and archiving of programmatic data and documentation. Continue advanced prototype development product #1 until maturity for a Preliminary Design Review (PDR) and archiving programmatic documentation for future efforts if funding becomes available. Continue product #2 development through operational testing with USSOCOM forces and archiving programmatic documentation.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	3.798	3.819	-
<b>Accomplishments/Planned Programs Subtotals</b>	6.819	7.235	6.286

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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**C. Other Program Funding Summary (\$ in Millions)**

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• DE5: Decontamination (SDD)	15.399	7.989	16.954	-	16.954	9.729	5.074	9.793	9.317	Continuing	Continuing
• JD0050: DECONTAMINATION FAMILY OF SYSTEMS (DFoS)	16.384	17.050	10.804	-	10.804	9.022	11.644	16.748	36.588	Continuing	Continuing
• JD0070: JOINT BIOLOGICAL AGENT DECONTAMINATION SYSTEM (JBADS)	0.000	24.609	3.404	-	3.404	16.405	18.708	0.964	0.000	0.000	64.090

**Remarks**

**D. Acquisition Strategy**

CBRN COVERS COATINGS AND PROTECTIVE OVERLAYS (C3PO)

The C3PO acquisition approach involves the use of the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA), Competitive/Firm Fixed Price (C/FFP) contract, to design and develop state of the art equipment using competitive and iterative prototyping. The C3PO program will evaluate Commercial Off the Shelf options to reduce development costs. The program will test prototypes against live chemical warfare agents and biological warfare agents, conduct reliability, availability, and maintainability testing, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards.

CONTAMINATED HUMAN REMAINS SYSTEM (CHRS)

The CHRS program will leverage previous efforts under a Joint Urgent Operational Needs Statement (JUONS) which have accelerated the CHRT project. Additional minor design modifications, developmental and operational testing is part of the overall acquisition strategy. Product development consists of the design and prototyping of a CHRT. The contracting strategy will use the Countering Weapons of Mass Destruction Other Transaction Agreement (CWMD OTA) to procure prototype units, followed by Developmental Testing (DT). Following DT completion, an In-Process Review will be conducted. A Logistics Demonstration (LD) and Operational Testing (OT) will be conducted. An Operational Test Agency (OTA) Evaluation Report (OER) will be written, and technical reviews will be conducted, in preparation for a Milestone C/Full Rate Production decision.

MASS PERSONNEL DECON (MPD)

The MPD program will develop the equipment, processes and procedures for DoD-affiliated personnel contaminated by chemical, biological, and radiological agents to achieve ambulatory and non-ambulatory throughput requirements as dictated by the needs of the Services, while considering various mission scenarios. As part of the acquisition strategy, key product developmental efforts will begin with the program achieving a MS A in 1QFY20, and includes efforts for the reduction of current MPD System costs by assessing existing Mass Casualty Decontamination (MCD) equipment and processes as well as new technology through the use of Requests

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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 (ACD&amp;P)</i>
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For Information (RFI's), Market Research Analyses and Technology Demonstrations. Data collected from prior equipment demonstrations as well as fieldings of commercial MCD systems in support of two validated Operational Needs Statements will inform the program as well. A competitive/sole source contract for prototyping and production units will be awarded, followed by Milestone B. Results of Prototyping will inform developmental and operational testing effort, followed by Milestone C/Full Rate Production Approval. These efforts will additionally support the development of hazardous waste disposal and integration with a Contaminated Human Remains capability.

**SERVICE EQUIPMENT DECONTAMINATION SYSTEM (SEDS)**

The SEDS program will utilize the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) to design and develop state of the art equipment using competitive and iterative prototyping. The program will test prototypes against live chemical warfare agents and biological warfare agents, conduct reliability, availability, and maintainability testing, conduct regular user evaluations to identify human system integration issues, and will conduct testing to ensure the system meets military standards.

**TACTICAL DISABLEMENT SYSTEM (TACDS)**

TacDS is being developed as a FoS using GOTS, modified COTS, and developmental technologies of varying maturity; up to 7 products may be needed to fully satisfy the entire requirements set. The FoS program structure of TacDS was developed with streamlining in mind, allowing flexible development of multiple products to optimize the use of available resources and for the PMO to quickly adapt to shifting priorities and initiate or expedite development of specific products as resources permit. A tailored/streamlined approach to acquisition documentation ensures robust program and risk management while ensuring effective utilization of available personnel resources and more efficient staffing, while product/technology-specific streamlining opportunities are being evaluated and implemented to the maximum extent possible as each product is advanced.

The TacDS FoS program successfully obtained a MS A decision authorizing entry of all capabilities to be developed under the program into the Technology Maturation and Risk Reduction (TMRR) phase of the Acquisition Lifecycle in March 2018. Two products have since been advanced and are currently progressing through an approved streamlined A to C acquisition approach; Product #1, Thermite Bag, a man-portable destruction capability, and Product #2, Epoxy Kit, a delay capability. An IPR will replace the traditional MS B checkpoint and be conducted for each product to authorize transition from TMRR to EMD phase activities. Concurrent development of two technologies leverages available manpower and distributes resources across multiple efforts to reduce cost and schedule. Streamlined acquisition documentation and T&E procedures are being utilized in the development of both products as well as streamlined contracting mechanisms. Separate contracts/transactions will be used to develop, test, and procure each product, with the Countering Weapons of Mass Destruction Other Transaction Agreement (CWMD OTA) being used to maximum extent possible as a flexible mechanism to engage industry, drive competition, and reduce transaction timelines. Results of testing and user evaluations for each product will determine design maturity and facilitate identification of opportunities to further accelerate the schedule.

In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities. The requirements and capability gaps will remain. The Product #1 (Thermite Bag) will be developed in FY 20 to the advanced prototype stage. Programmatic information and all Intellectual Property (IP) will be archived for later use if program is

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	DE4 / <i>Decontamination (ACD&amp;P)</i>

revived. Product #2 (Epoxy Kit) will be accelerated in FY20 through Operational Test Phase and all data/IP will be transferred to SOCOM for procurement/fielding under their Title 10 Authority.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (ACD&P)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
C3PO - HW S - Advanced Product Development	C/FFP	TBD : N/A	0.000	0.000		0.000		0.701	Jun 2021	-		0.701	Continuing	Continuing	0.000
CHRS - HW S - CHRT - Prototypes Development	C/FFP	Advanced Technologies International : Summerville, SC	1.317	0.287	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPD - HW S - Hardware System	C/FFP	Advanced Technologies International : Summerville, SC	0.000	0.188	Jul 2019	1.060	Mar 2020	0.312	Jan 2021	-		0.312	Continuing	Continuing	0.000
SEDS - HW S - SEDS Product Development	C/FFP	TBD : N/A	0.000	0.000		0.000		0.751	Jun 2021	-		0.751	Continuing	Continuing	0.000
TACDS - HW S - OTA Prototype Development - Product 1	MIPR	Southwest Research Institute : San Antonio, TX	0.000	1.266	Mar 2019	0.300	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
TACDS - HW S - OTA Prototype Development - Product 2	MIPR	Applied Research Associates : Inc., Littleton, CO	0.000	0.946	Aug 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			1.317	2.687		1.360		1.764		-		1.764	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
C3PO - ES SB S - Logistics, Engineering, and IPT Support	MIPR	Various : Various	0.000	0.000		0.000		0.348	Dec 2020	-		0.348	Continuing	Continuing	0.000
CHRS - TD/D S - Logistics, Engineering, and IPT Support	MIPR	Various : Various	2.185	0.904	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPD - ES SB S - Logistics, Engineering, and IPT Support	Various	Various : Various	0.000	0.053	Jan 2019	0.323	Apr 2020	1.152	Dec 2020	-		1.152	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (ACD&P)
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<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
SEDS - ES SB - SEDS Logistics, Engineering and IPT Support	MIPR	Various : Various	0.000	0.000		0.000		0.417	Dec 2020	-		0.417	Continuing	Continuing	0.000
TACDS - TD/D S - Logistics, Engeneering, and IPT Support	Various	Various : Various	1.402	1.231	Jan 2019	2.887	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			3.587	2.188		3.210		1.917		-		1.917	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
C3PO - Other S - IPT Testing Planning Support	MIPR	Various : Various	0.000	0.000		0.000		0.249	Dec 2020	-		0.249	Continuing	Continuing	0.000
CHRS - CHRT - DT/OT	Various	Various : Various	0.764	0.892	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPD - OTHS - System Component Testing, Prototype Testing, DT, Test Planning	MIPR	Various : Various	0.000	0.207	May 2019	0.595	Apr 2020	0.800	Mar 2021	-		0.800	Continuing	Continuing	0.000
SEDS - OTHS - SEDS T&E IPR Test Planning	MIPR	Various : Various	0.000	0.000		0.000		0.235	Dec 2020	-		0.235	Continuing	Continuing	0.000
<b>Subtotal</b>			0.764	1.099		0.595		1.284		-		1.284	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
C3PO - PM/MS S- Program Management Support	MIPR	Various : Various	0.000	0.000		0.000		0.345	Dec 2020	-		0.345	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (ACD&P)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025											
	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								
C3PO - RFP / MS A Preparation									■	■	■	■																								
C3PO - MS A											■	■																								
C3PO - Acquisition Program Baseline (APB)											■	■																								
C3PO - Test and Evaluation Master Plan (TEMP)											■	■																								
C3PO - System Engineering Plan (SEP)											■	■																								
C3PO - Request for Proposal (RFP)											■	■																								
C3PO - Development Contract Award											■	■																								
C3PO - Prototype Delivery 1												■	■																							
C3PO - Prototype Testing 1													■	■																						
C3PO - Prototype Delivery 2														■	■																					
C3PO - Prototype Testing 2															■	■																				
C3PO - Capabilities Development Document (CDD)																■	■																			
C3PO - Production Representative System Delivery																	■	■																		
C3PO - Development Test (DT)																		■	■																	
C3PO - Operational Testing (OT)																			■	■																
C3PO - MS C FRP Decision																				■	■															
C3PO - Production Contract Award																					■	■														
C3PO - Lifecycle Sustainment Plan (LCSP)																						■	■													
C3PO - Initial Operational Capability (IOC)																							■	■												
CHRS - Capability Development Document (CDD) - CHRT		■	■																																	
CHRS - Critical Design Review (CDR) - CHRT				■																																

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CHRS - Operational Test (OT) - CHRT				■																								
CHRS - Joint Independent Logistics Assessment (JILA) - CHRT							■	■	■																			
CHRS - Type Classification/Material Release - CHRT									■	■																		
CHRS - MS C- CHRT									■	■																		
CHRS - Full Rate Production (FRP) - CHRT									■	■																		
CHRS - Initial Operational Capability (IOC) - CHRT																												
CHRS - Full Operational Capability (FOC) - CHRT																												
MPD - Systems Engineering Plan (SEP)				■																								
MPD - Life Cycle Sustainment Plan (LCSP)					■	■																						
MPD - MS A																												
MPD - Request for Proposal (RFP)																												
MPD - Contract Award																												
MPD - Prototype Testing																												
MPD - MS B																												
MPD - Acquisition Program Baseline (APB)																												
MPD - Test Evaluation Master Plan (TEMP)																												
MPD - Contract Option																												
MPD - Critical Design Review (CDR)																												
MPD - Development Test (DT)																												
MPD - In Process Review (IPR)																												
MPD - Operational Test (OT)																												
MPD - Initial Operational Test and Evaluation (IOT&E)																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
MPD - MS C																												
MPD - Full Rate Production (FRP)																												
MPD - Initial Operational Capability (IOC)																												
SEDS - MS A Preparation																												
SEDS - Acquisition Program Baseline (APB)																												
SEDS - MS A																												
SEDS - Acquisition Decision Memorandum (ADM)																												
SEDS - System Engineering Plan (SEP)																												
SEDS - Request For Proposal (RFP)																												
SEDS - SEDS - Contract Award - Technology Maturation and Risk Reduction (TMRR)																												
SEDS - Prototype Development and Delivery 1																												
SEDS - Prototype Testing 1																												
SEDS - Prototype Development and Delivery 2																												
SEDS - Prototype Testing 2																												
SEDS - Capability Development Document (CDD)																												
SEDS - MS B																												
SEDS - Final Test and Evaluation Master Plan																												
SEDS - Contract Award - Engineering, Manufacturing and Development (EMD)																												
SEDS - Engineering, Manufacturing and Development of Systems																												
SEDS - Developmental Testing (DT)																												
TACDS - Contract Award/ Kick-off Meeting Product 1																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
TACDS - System Requirements Review (SRR) Product 1																												
TACDS - Technology Readiness Assessment (TRA) Product 1																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (ACD&P)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C3PO - RFP / MS A Preparation	1	2021	2	2021
C3PO - MS A	3	2021	3	2021
C3PO - Acquisition Program Baseline (APB)	3	2021	3	2021
C3PO - Test and Evaluation Master Plan (TEMP)	3	2021	3	2021
C3PO - System Engineering Plan (SEP)	3	2021	3	2021
C3PO - Request for Proposal (RFP)	3	2021	3	2021
C3PO - Development Contract Award	3	2021	3	2021
C3PO - Prototype Delivery 1	4	2021	4	2021
C3PO - Prototype Testing 1	1	2022	1	2022
C3PO - Prototype Delivery 2	3	2022	3	2022
C3PO - Prototype Testing 2	4	2022	4	2022
C3PO - Capabilities Development Document (CDD)	2	2023	2	2023
C3PO - Production Representative System Delivery	4	2023	4	2023
C3PO - Development Test (DT)	1	2024	1	2024
C3PO - Operational Testing (OT)	2	2024	2	2024
C3PO - MS C FRP Decision	3	2024	3	2024
C3PO - Production Contract Award	3	2024	3	2024
C3PO - Lifecycle Sustainment Plan (LCSP)	1	2025	1	2025
C3PO - Initial Operational Capability (IOC)	2	2025	2	2025
CHRS - Capability Development Document (CDD) - CHRT	2	2019	2	2019
CHRS - Critical Design Review (CDR) - CHRT	4	2019	4	2019
CHRS - Operational Test (OT) - CHRT	4	2019	4	2019

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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Events	Start		End	
	Quarter	Year	Quarter	Year
CHRS - Joint Independent Logistics Assessment (JILA) - CHRT	2	2020	3	2020
CHRS - Type Classification/Material Release - CHRT	3	2020	3	2020
CHRS - MS C- CHRT	3	2020	3	2020
CHRS - Full Rate Production (FRP) - CHRT	3	2020	3	2020
CHRS - Initial Operational Capability (IOC) - CHRT	3	2021	3	2021
CHRS - Full Operational Capability (FOC) - CHRT	3	2022	3	2022
MPD - Systems Engineering Plan (SEP)	4	2019	4	2019
MPD - Life Cycle Sustainment Plan (LCSP)	1	2020	1	2020
MPD - MS A	2	2020	2	2020
MPD - Request for Proposal (RFP)	2	2020	2	2020
MPD - Contract Award	2	2020	2	2020
MPD - Prototype Testing	3	2020	1	2021
MPD - MS B	1	2021	1	2021
MPD - Acquisition Program Baseline (APB)	1	2021	1	2021
MPD - Test Evaluation Master Plan (TEMP)	1	2021	1	2021
MPD - Contract Option	2	2021	2	2021
MPD - Critical Design Review (CDR)	2	2021	2	2021
MPD - Development Test (DT)	3	2021	1	2022
MPD - In Process Review (IPR)	1	2023	1	2023
MPD - Operational Test (OT)	4	2022	2	2023
MPD - Initial Operational Test and Evaluation (IOT&E)	4	2022	2	2023
MPD - MS C	4	2023	4	2023
MPD - Full Rate Production (FRP)	4	2023	4	2023
MPD - Initial Operational Capability (IOC)	3	2024	3	2024
SEDS - MS A Preparation	1	2021	2	2021

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (ACD&P)
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Events	Start		End	
	Quarter	Year	Quarter	Year
SEDS - Acquisition Program Baseline (APB)	3	2021	3	2021
SEDS - MS A	3	2021	3	2021
SEDS - Acquisition Decision Memorandum (ADM)	3	2021	3	2021
SEDS - System Engineering Plan (SEP)	3	2021	3	2021
SEDS - Request For Proposal (RFP)	3	2021	3	2021
SEDS - SEDS - Contract Award - Technology Maturation and Risk Reduction (TMRR)	3	2021	3	2021
SEDS - Prototype Development and Delivery 1	4	2021	4	2021
SEDS - Prototype Testing 1	1	2022	1	2022
SEDS - Prototype Development and Delivery 2	3	2022	3	2022
SEDS - Prototype Testing 2	4	2022	4	2022
SEDS - Capability Development Document (CDD)	2	2023	2	2023
SEDS - MS B	2	2023	2	2023
SEDS - Final Test and Evaluation Master Plan	2	2023	2	2023
SEDS - Contract Award - Engineering, Manufacturing and Development (EMD)	3	2023	3	2023
SEDS - Engineering, Manufacturing and Development of Systems	3	2023	2	2024
SEDS - Developmental Testing (DT)	2	2024	4	2024
TACDS - Contract Award/ Kick-off Meeting Product 1	2	2019	2	2019
TACDS - System Requirements Review (SRR) Product 1	1	2020	1	2020
TACDS - Technology Readiness Assessment (TRA) Product 1	1	2020	1	2020

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IP4: Individual Protection (ACD&P)	-	3.172	1.997	2.483	-	2.483	3.487	0.000	4.682	8.946	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project includes the development of next generation individual protective ensembles (e.g., suits, boots, and gloves) that enable the Joint Forces to survive and continue the mission in Chemical, Biological, and Radiological (CBR) contaminated environments.

Efforts included in this project are:

- (1) Uniform Integrated Protection Ensemble Family of Systems (UIPE FoS)
- (2) UIPE FoS Gloves
- (3) UIPE FoS General Purpose (GP) (i.e. Land)

UIPE FoS will develop a family of systems that will provide the broad spectrum of users with individual percutaneous protective equipment allowing the ability to operate in a contaminated environment with no or minimal degradation in performance. UIPE FoS will provide protection from operationally relevant traditional and non-traditional CBRN threats likely to be encountered during joint force operations.

In FY21, UIPE FoS transitions to UIPE FoS GP (i.e. Land), UIPE FoS Air and UIPE FoS Gloves. The family of systems is being developed based on agreed upon Service Mission Areas of which there are four: Land, Sea, Air, and Homeland Defense. Each of the Mission Areas have unique mission requirements that the combined UIPE FoS solutions will fulfill. The overarching goal of each of the four Mission Areas is to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems.

UIPE FoS Gloves will provide percutaneous protection to the Warfighter against traditional and non-traditional CBRN threats. UIPE FoS Gloves will provide improved facility and dexterity, and for some Mission Areas, a touchscreen capability.

UIPE FoS GP (i.e. Land) will provide a family of systems that will give the Warfighter percutaneous protection from operationally relevant traditional, non-traditional, and advanced CBRN/Toxic Industrial Material (TIM) threats likely to be encountered during joint force operations.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) UIPE FoS	3.172	1.997	-
<b>Description:</b> Concept Design Evaluation/Technology Maturation and Risk Reduction (TMRR)			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Complete design phase activities, complete system level testing on all prototypes and non-developmental item candidates, begin Tradespace Analysis; update the Business Case Analysis (BCA).</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (UIPE FoS GP &amp; UIPE FoS GLOVE)</p>			
<p><b>Title:</b> 2) UIPE FoS Gloves</p> <p><b>Description:</b> Development of the Next Generation Protective Glove</p> <p><b>FY 2021 Plans:</b> Conduct program planning that includes developing the Statement of Objectives for a call for White Papers and the overall Acquisition and Test Strategy. Begin glove prototype development (qty 2). Mission area focus includes: Land, Sea, Air, and Homeland Defense.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (UIPE FoS)</p>	-	-	0.494
<p><b>Title:</b> 3) UIPE FoS GP</p> <p><b>Description:</b> Development of the Next Generation Protective Ensembles</p> <p><b>FY 2021 Plans:</b> Conduct evaluation to determine which candidates are ready to enter the Engineering and Manufacturing Development (EMD) phase; conduct the Independent Logistics Assessment; conduct a Preliminary Design Review and receive Milestone B approval. Mission area focus includes: Land, Sea, and Homeland Defense.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (UIPE FoS)</p>	-	-	1.989
<b>Accomplishments/Planned Programs Subtotals</b>	3.172	1.997	2.483

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• IP5: Individual Protection (SDD)	10.597	12.663	12.960	-	12.960	12.858	12.796	8.963	8.436	Continuing	Continuing
• JI0002: JS AIRCREW MASK (JSAM)	50.214	56.846	72.550	-	72.550	67.325	50.412	8.247	0.000	0.000	305.594

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

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

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• JI0003: JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)	18.359	13.209	22.402	-	22.402	15.128	3.875	0.000	0.000	0.000	72.973
• MA0401: CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)	12.264	14.984	1.492	-	1.492	0.457	0.000	0.000	0.000	0.000	29.197

**Remarks**

**D. Acquisition Strategy**

CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE FAMILY OF SYSTEMS (UIPE FOS)

The UIPE FoS program will conduct market research through both Requests For Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Candidate technologies will follow the same acquisition strategy employed for the suit: Early User Tests/Wear events and material and system level testing to identify available capabilities followed by a Trade Space Analysis to determine the most suitable glove(s). The UIPE FoS GP program will monitor S&T activities for possible technology transitions.

In FY21, UIPE FoS transitions to UIPE FoS GP, UIPE FoS Air and UIPE FoS Gloves. In order to reflect the structure of the program, UIPE FoS will meet Mission Area needs, not individual Service needs. The four Mission Areas are: Land (i.e. GP), Air, Sea, and Homeland Defense. Each of the Mission Areas has unique mission requirements that the UIPE FoS GP, Air and Gloves solutions will seek to fulfill.

UNIFORM INTEGRATED PROTECTIVE ENSEMBLE FOS GLOVES (UIPE FOS GLOVES)

The UIPE FoS program will conduct market research through both Requests For Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Candidate technologies will undergo Early User Tests/Wear events and material and system level testing to identify available capabilities followed by a Trade Space Analysis to determine the most suitable solution(s).

UNIFORM INTEGRATED PROTECTIVE ENSEMBLE GENERAL PURPOSE (UIPE FOS GP)

The UIPE FoS GP program utilized an Other Transaction Authority (OTA) contracting approach to procure informational white papers during the Technology Maturation and Risk Reduction (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. The OTA yielded several different prototypes that are undergoing material and system

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	IP4 / <i>Individual Protection (ACD&amp;P)</i>

level testing and Early User Tests. Along with the OTA prototypes, the program is exploring the feasibility of a layered concept designed by the government and a manufacturing partner.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
UIPE FOS - HW S - Prototype Development	Various	Various : Various	0.000	1.768	Dec 2018	0.744	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS GLOVES - HW C - Prototype Development	MIPR	Various : Various	0.000	0.000		0.000		0.290	Dec 2020	-		0.290	Continuing	Continuing	0.000
UIPE FOS GP - HW C - Prototype Development	Various	Various : Various	0.000	0.000		0.000		0.584	Dec 2020	-		0.584	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	1.768		0.744		0.874		-		0.874	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
UIPE FOS - UIPE - ES S - Engineering and Technical IPT Support / SME Support	MIPR	Various : Various	0.000	0.286	Feb 2019	0.000	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS GLOVES - ES C - Engineering and Technical IPT Support / SME Support	MIPR	Various : Various	0.000	0.000		0.000		0.100	Dec 2020	-		0.100	Continuing	Continuing	0.000
UIPE FOS GP - ES C - Engineering and Technical IPT Support/PM and SME Support	Various	Various : Various	0.000	0.000		0.000		0.987	Dec 2020	-		0.987	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.286		0.000		1.087		-		1.087	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
UIPE FOS - UIPE - DTE S - DT Design	MIPR	Various : Various	0.000	1.118	Nov 2018	1.063	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 FOS - Air System Testing	██████████																											
UIPE FOS - Land Early User Evaluation	██████████				██████████																							
UIPE FOS - Land Material Testing	██████████																											
UIPE FOS - Land Schedule Decision Point	████																											
UIPE FOS - Land System Testing	██████████																											
UIPE FOS - Land Manufacture Test Articles (Prototypes)					██████████																							
UIPE FOS - Air USN/USMC Initial OT&E					████																							
UIPE FOS - Air Production Award					████																							
UIPE FOS GLOVES - Acquisition and Test Planning and Prototype Development									██████████																			
UIPE FOS GLOVES - Early User, material and system level testing													████															
UIPE FOS GLOVES - Trade Space Analysis Decision													████															
UIPE FOS GLOVES - Milestone B													████															
UIPE FOS GLOVES - DT/OT													██████████															
UIPE FOS GP - Decision Point 2 - Candidates for EMD Phase									████																			
UIPE FOS GP - Independent Logistics Assessment									████																			
UIPE FOS GP - Capability Development Document (CDD)									████																			
UIPE FOS GP - Test & Evaluation Master Plan (TEMP) Update									████																			
UIPE FOS GP - Milestone B									████																			

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 FOS GP - Manufacturing Readiness Assessment (MRA)											■																	
UIPE FOS GP - EMD Phase Contract											■																	
UIPE FOS GP - Make or Buy Decision											■																	
UIPE FOS GP - DT/OT											■	■																
UIPE FOS GP - CDD Update															■													
UIPE FOS GP - Milestone C															■													
UIPE FOS GP - LRIP															■													
UIPE FOS GP - Initial Operational Capability (IOC)																				■								
UIPE FOS GP - FRP																				■								
UIPE FOS GP - Full Operational Capability (FOC)																												■

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS - Air System Testing	1	2019	1	2020
UIPE FOS - Land Early User Evaluation	1	2019	4	2020
UIPE FOS - Land Material Testing	1	2019	4	2019
UIPE FOS - Land Schedule Decision Point	2	2019	2	2019
UIPE FOS - Land System Testing	1	2019	2	2020
UIPE FOS - Land Manufacture Test Articles (Prototypes)	4	2019	2	2020
UIPE FOS - Air USN/USMC Initial OT&E	2	2020	2	2020
UIPE FOS - Air Production Award	3	2020	3	2020
UIPE FOS GLOVES - Acquisition and Test Planning and Prototype Development	1	2021	4	2021
UIPE FOS GLOVES - Early User, material and system level testing	1	2022	1	2022
UIPE FOS GLOVES - Trade Space Analysis Decision	2	2022	2	2022
UIPE FOS GLOVES - Milestone B	2	2022	2	2022
UIPE FOS GLOVES - DT/OT	3	2022	4	2022
UIPE FOS GP - Decision Point 2 - Candidates for EMD Phase	1	2021	1	2021
UIPE FOS GP - Independent Logistics Assessment	1	2021	1	2021
UIPE FOS GP - Capability Development Document (CDD)	2	2021	2	2021
UIPE FOS GP - Test & Evaluation Master Plan (TEMP) Update	2	2021	2	2021
UIPE FOS GP - Milestone B	2	2021	2	2021
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)	3	2021	3	2021
UIPE FOS GP - EMD Phase Contract	3	2021	3	2021
UIPE FOS GP - Make or Buy Decision	3	2021	3	2021
UIPE FOS GP - DT/OT	4	2021	3	2022

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS GP - CDD Update	4	2022	4	2022
UIPE FOS GP - Milestone C	1	2023	1	2023
UIPE FOS GP - LRIP	1	2023	1	2023
UIPE FOS GP - Initial Operational Capability (IOC)	4	2023	4	2023
UIPE FOS GP - FRP	4	2023	4	2023
UIPE FOS GP - Full Operational Capability (FOC)	4	2024	4	2024

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IS4: Information Systems (ACD&P)	-	0.821	0.528	4.661	-	4.661	4.257	4.052	4.048	3.852	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) Global Biosurveillance Portal (Global-BSP),
- (2) CBRN Integrated Early Warning (CBRN IEW),
- (3) Joint Effects Model 2 (JEM 2),
- (4) Joint Warning and Reporting Network 2 (JWARN 2), and
- (5) Software Support Activity (SSA).

The Global-BSP is an unclassified, web-based computer and mobile application which facilitates collaboration, communication, and information sharing in support of the preparedness, detection, management, and mitigation of CBRN, as well as all hazard events. These capabilities enable the use of data visualization, real-time messaging and file sharing, and DoD and USG cooperation to expedite the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

CBRN IEW is a continuation of ECD IEW (CBRN IEW has transitioned from Project Contamination Avoidance (CA4) to Project Information Systems (IS4)). CBRN IEW will utilize residual capabilities from the Capabilities to Enable NBC Threat Awareness Understanding and Reporting (CENTAUR) deployed to Eighth Army as well as ECD IEW lessons learned to transition and integrate successful mature technologies into a baseline IEW framework to support environmental monitoring and biological surveillance to support immediate force health protection requirements. Applicable technologies within the CBRN IEW will be experimented, integrated, networked, and deployed through rapid acquisition methods and transitioned to programs of record to achieve integrated early warning in accordance with OSD IEW Campaign Plan. CBRN IEW will utilize Table-Top exercises (TTX), Operational Demonstrations, and other venues to provide sensor interoperability and interdependence and integrated layered defense in order to increase readiness within the CBRN IEW.

The JEM 2 is a software application that provides the Department of Defense (DoD) with the only operationally tested and accredited tool to model and simulate the effects of CBRN weapon strikes and incidents. JEM 2 applies advanced physics using weather, terrain, and agent characteristics to predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM). JEM 2 displays hazard information on the Common Operational Picture (COP) and allows commanders to assess risk and take steps to mitigate the effects of Weapons of Mass Destruction (WMD) on operational forces.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 JWARN 2 is a software application that provides the DoD with a warning and reporting system that enables an immediate and integrated response to threats of contamination by WMD, CBRN, and TIM incidents. JWARN 2 provides a digital display of CBRN reports on the COP, presented through Service-provided Command and Control systems resident at all echelons of command. Enhanced situational battlespace awareness provides Commanders the ability to support warfighter battle management and continuity of operations in a contaminated environment.

The SSA provides for enterprise services in the areas of software development, system/network architectures, cybersecurity, technology transition, and information assurance standards and policies to support programs in the evaluation of emerging technologies for transition, standards compliance, interoperability, and cybersecurity risk management framework development.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) Global-BSP</p> <p><b>Description:</b> Program Management</p> <p><b>FY 2020 Plans:</b> Manage development efforts to satisfy G-BSP requirements in preparation for Full Operational Capability Fielding Decision.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	0.042	0.021	-
<p><b>Title:</b> 2) Global-BSP</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Complete remaining efforts for risk-mitigation activities, developing, and evaluating new technologies. Continue efforts to provide high-fidelity models, tools, and resources from both internal and external developers for transition into Global-BSP as needed. Complete SOCOM-defined Secure Internet Protocol Router (SIPR) requirement for Global-BSP.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	0.422	0.139	-
<p><b>Title:</b> 3) Global-BSP</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b></p>	0.076	0.048	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Perform Training Development, Integrated Logistic Support, and Configuration Management.				
<p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>				
<p><b>Title:</b> 4) CBRN Integrated Early Warning (CBRN IEW)</p> <p><b>Description:</b> Implementation of common CBRN integrated systems architecture throughout the sensor portfolio enabling a common operating environment and integration hub with sensor data analysis and integrated layered defense.</p> <p><b>FY 2021 Plans:</b> Begin integrated systems architecture using current COTS and GOTS sensors and software to test interoperability and increase commanders situational awareness and speed of effects in fielded systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Program/project funding transferred from Enhanced Capability Demonstration Integrated Early Warning (ECD IEW) (Research, Development Test &amp; Evaluation (RDT&amp;E) Item CA4).</p>		-	-	4.587
<p><b>Title:</b> 5) Joint Effects Model 2 (JEM 2)</p> <p><b>Description:</b> Prototyping and Development</p> <p><b>FY 2020 Plans:</b> Continue to transition and integrate the JEM and Hazard Predication and Analysis Capability (HPAC) architecture, based on the Common Chemical, Biological, Radiological, and Nuclear (CBRN) Model Interface (CCMI) single architecture project and develop, transition, and integrate S&amp;T capabilities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.072	0.210	-
<p><b>Title:</b> 6) JEM 2</p> <p><b>Description:</b> Management Support</p> <p><b>FY 2020 Plans:</b> Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		-	0.029	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.			
<b>Title:</b> 7) Joint Warning and Reporting Network 2 (JWARN 2) <b>Description:</b> Prototyping	0.071	-	-
<b>Title:</b> 8) JWARN 2 <b>Description:</b> Technical Support	0.047	-	-
<b>Title:</b> 9) Software Support Activity (SSA) <b>Description:</b> Enterprise Service  <b>FY 2020 Plans:</b> Support the CBRND enterprise through continuous engagement to assist with the development of acquisition products by providing early architecture diagrams for pre-Milestone B activities to reduce risk. <b>FY 2021 Plans:</b> Continue to engage with enterprise programs to assist with the development of acquisition products and documentation in the areas of system/network architectures, cybersecurity risk management framework, information assurance, interoperability, and standards and policy compliance for Milestone C activities to reduce risk. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.	0.091	0.081	0.074
<b>Accomplishments/Planned Programs Subtotals</b>	0.821	0.528	4.661

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2021</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To</b>	<b>Total Cost</b>
			<b>Base</b>	<b>OCO</b>	<b>Total</b>					<b>Complete</b>	
• IS5: Information Systems (SDD)	21.993	21.166	6.019	-	6.019	5.691	5.232	5.232	5.493	Continuing	Continuing
• IS7: Information Systems (Op Sys Dev)	14.039	16.111	3.234	-	3.234	3.554	15.381	15.383	16.154	Continuing	Continuing
• G47101: JOINT WARNING & REPORTING NETWORK (JWARN)	0.502	0.442	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.944
• JC0208: JOINT EFFECTS MODEL (JEM)	0.911	0.689	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.600

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

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

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	
			Base	OCO	Total					Complete	Total Cost
• JS5230: SOFTWARE SUPPORT ACTIVITY (SSA)	0.094	0.081	0.074	-	0.074	0.070	1.187	1.187	1.247	Continuing	Continuing
• JX0301: BIOSURVEILLANCE PORTAL (BSP)	1.148	1.124	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.272

**Remarks**

**D. Acquisition Strategy**

BIOSURVEILLANCE PORTAL (BSP)

The Global-BSP program is using the SOFCIDS (Special Operations Capabilities Integration and Development System) requirements approach and the JROC's "IT Box" acquisition construct which allows fielding of operational capabilities while continued R&D matures technology required for follow-on versions. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple iterative fielding events in lieu of a single fielding event, and field products to the warfighter utilizing an incremental delivery approach. The Global-BSP will achieve Full Operational Capability, complete resourced capabilities, and commence an orderly transition to sustainment in 2020. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

CBRN INTEGRATED EARLY WARNING (CBRN IEW)

CBRN IEW Focuses on technology maturation, demonstration, integration and transitioning early warning capability sets to fielded CBDP programs of record to combat emerging and potentially urgent threats within the multi-domain operations spectrum. Contracting strategy includes the use of Other Transaction Authority R&D and prototyping. Annual development cycles and capability drops are requested and validated by all DOD services in the OSD DAS(D) IEW Campaign Plan and prioritized based on National Defense Strategy and National Military Strategy goals. Current strategy also collaborates with multi-agency partners to obtain synergy and interoperability across the areas of sensor data analytics, integrated early warning, and protect to warn/protect to treat capabilities.

JOINT EFFECTS MODEL (JEM)

The JEM 2 acquisition strategy utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching Milestone B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JEM will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

JOINT WARNING & REPORTING NETWORK (JWARN)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> IS4 / <i>Information Systems (ACD&amp;P)</i>

JWARN 2 acquisition utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching MS B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JWARN will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

**SOFTWARE SUPPORT ACTIVITY (SSA)**

Software Support Activity (SSA) is a non-acquisition, service organization that provides professional subject matter expertise support throughout the CBDP Enterprise. These services are provided by government and contract personnel with expertise in software development, network architecture, cybersecurity, technology transitions, information assurance, and standards and policies compliance, and are provided throughout the lifecycle of programs within the CBDP portfolio. These efforts facilitate the efficient development, transition, fielding, modernization, and sustainment of interoperable and integrated CBRN capabilities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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 Development	FFRDC	Johns Hopkins University - Applied Physics Lab : Laurel, MD	2.241	0.422	Dec 2018	0.185	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JEM - JEM 2 - Development and Integration	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	6.839	0.072	Jan 2019	0.239	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- SW S - Prototype Dev Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.001	0.071	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			9.081	0.565		0.424		0.000		-		0.000	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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 - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.076	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBRN IEW - Network Architecture	C/CPFF	TBD : N/A	0.000	0.000		0.000		1.500	Jan 2021	-		1.500	Continuing	Continuing	0.000
CBRN IEW - Systems Integration	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.750	Jan 2021	-		0.750	Continuing	Continuing	0.000
JWARN - 2 ES S - Engineering Support	MIPR	Various : Various	8.975	0.047	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
SSA - TD/D C - Engineering Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.486	0.091	Nov 2018	0.081	Nov 2019	0.074	Nov 2020	-		0.074	Continuing	Continuing	0.000
<b>Subtotal</b>			9.461	0.214		0.081		2.324		-		2.324	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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 IEW - Development Test	MIPR	Various : Various	0.000	0.000		0.000		0.800	Jan 2021	-		0.800	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		0.000		0.800		-		0.800	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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 - PM/MS S - Program Management Support	Various	Various : Various	1.102	0.042	Dec 2018	0.023	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN IEW - Matrix Government Labor	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		1.000	Jan 2021	-		1.000	Continuing	Continuing	0.000
CBRN IEW - Labor and Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.537	Oct 2020	-		0.537	Continuing	Continuing	0.000
<b>Subtotal</b>			1.102	0.042		0.023		1.537		-		1.537	Continuing	Continuing	N/A

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>		19.644	0.821	0.528	4.661	-	4.661	Continuing	Continuing	N/A

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSP - RDP-1	1	2019	4	2020
BSP - CSG BD 9, 10	2	2019	2	2019
BSP - Final Operational Test and Evaluation - RDP 1	3	2020	4	2020
BSP - FOC	4	2020	4	2020
CBRN IEW - ICD	2	2021	2	2021
CBRN IEW - Initial Sensor Integration	1	2021	4	2021
JEM Increment 2 - RDP 4	3	2019	4	2019
JEM Increment 2 - FD 3	3	2019	3	2019
JEM Increment 2 - FD 4	3	2020	3	2020
JEM Increment 2 - Govt DT / OT / V&V	1	2019	4	2020
JEM Increment 2 - BD 4	1	2019	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2020	4	2020
JWARN Increment 2 - Modernization and Update	1	2020	4	2020
JWARN Increment 2 - Product Development	1	2020	3	2020

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MB4: Medical Biological Defense (ACD&P)	-	63.783	46.166	47.727	-	47.727	37.689	42.517	31.436	35.462	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project includes Medical Countermeasure platform technologies, Medical Countermeasures (vaccines and therapeutics), development of reagents, assays, diagnostic equipment, biosurveillance and supporting efforts.

Efforts included in this project are:

- (1) Biosafety Level 4 Good Laboratory Practice Test and Evaluation (BSL4 GLP T&E)
- (2) Chem Bio Incident Preparedness and Response - Biosafety Level 4 Research Institute of Infectious Diseases (CBIPR - BSL4 RIID)
- (3) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR - ADM)
- (4) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B)
- (5) Medical Countermeasure Platform Technologies (MCMPT)
- (6) Next Generation Diagnostic System 2 (NGDS Increment 2)
- (7) NGDS 2 Chemical Diagnostics (NGDS 2 CHEMDX)
- (8) Filovirus Vaccine (VAC FILO)
- (9) Venezuelan Equine Encephalitis (VAC VEE)

The Medical Countermeasure BSL-4 GLP T&E capability performs T&E and provides the essential data packages to support US Food and Drug Administration (FDA) approval of leading biodefense medical countermeasure candidates to protect the Warfighter and the Nation. This capability provides dedicated capacity at U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) for Department of Defense (DoD) to conduct biosafety level studies to meet programmatic needs following all applicable regulatory, biosurety, and safety standards.

The capability building effort at the DoD ADM will establish and enhance proven biopharmaceutical and vaccine manufacturing technologies to accelerate the delivery of medical countermeasures as part of a medical integrated layered defense. The return on investment is an increased level of preparedness and responsiveness to counter current and emerging chemical and biological threats. By establishing and enhancing proven enabling technologies, the DoD ADM will accelerate development of medical countermeasures (MCMs) at all stages of development, enhance preparedness for existing threats, and accelerate response to emerging threats. MCMs impacted by these efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, Monoclonal antibodies, antibody fragments, and antibody conjugates for therapeutic and prophylactic use across all agent classes, and Adjuvants. Funds to support the state of readiness were previously provided through individual product development and manufacturing funding lines. The Department is providing dedicated funds (CBIPR-ADM) to support operational availability.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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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The CMDR-B program develops 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 FDA approved to prevent or minimize effects of MDR bacterial exposures. The candidate drug was approved by the FDA in Oct 2018 for Community Acquired Bacterial Pneumonia (CAPB) that was required as part of the acquisition strategy for the antibiotic repurposing program from S&T to advanced development.

MCMPT is establishing enabling technologies and pre positioning platform systems at the DoD's Advanced Development Manufacturing (ADM) facility using standardized discovery, design, manufacturing, and testing processes to reduce the medical countermeasure (MCM) development risks. Efforts will center on leveraging the ADM's facility and developing robust manufacturing processes. MCMPT will leverage platform technologies to streamline and accelerate the MCM delivery to the Force by reducing developmental risk. A subset of these technologies will be adapted to deliver a rapid response capability to novel and emerging threats. Through the Advanced Development and Manufacturing Antibody Technologies (ADAMANT) and Rapid Response platforms, MCMPT will deliver an enduring capability from which future candidates can be manufactured. The Agile Medical Paradigm (AMP) is the CDBP's strategic framework to accelerate the delivery of MCMs. To achieve this goal the DoD is establishing a medical countermeasures platform technology (MCMPT) capability.

The NGDS is a family of systems providing increments of diagnostic capabilities over time that address varied chemical, biological and radiological (CBR) threats across the different echelons of the Combat Health Support System. The mission of the NGDS is to provide 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 improves diagnostic capabilities in deployable and laboratory-based combat health support units. NGDS Increment 1 offers improved operational suitability and affordability over legacy systems by developing FDA cleared biological warfare agent (BWA) and infectious disease in vitro diagnostic (IVD) assays on an existing commercial diagnostic device with a well-established FDA regulatory history and pipeline of commercial non-BWA infectious disease diagnostic tests. 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. NGDS Increment 2 will provide additional capability for diagnosis of CBR-induced diseases, suitable for use in far forward environments, by developing lightweight, portable, and simple-to-use instruments and test kits. In FY21 NGDS Increment 2 has been broken out into two separate programs; NGDS 2 Man Portable Diagnostic System (MPDS) Program and NGDS 2 CHEMDX Program. NGDS 2 MPDS will complement NGDS Increment 1 by providing a lightweight, portable, and simple-to-use diagnostic capability to end-users in non-laboratory, far-forward environments. NGDS 2 CHEMDX will provide a lightweight, portable, and simple-to-use diagnostic capability to end-users in non-laboratory, far-forward environments.

The 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 working with Science & Technology (S&T) to further develop Ebola vaccine candidates to meet the DoD requirement. The current budget supports responsibly shelving program development efforts until prototype transition from our S&T partners. The DoD anticipates that the FDA will approve a vaccine using the Animal Rule, which allows for the demonstration of efficacy in a relevant animal model(s).

The VAC VEE Program develops a vaccine that will protect the Warfighter against aerosolized exposure to the alphavirus Venezuelan equine encephalitis. 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 (USAMRIID), Defense Threat Reduction Agency (DTRA), Joint Science Technology Office (JSTO)

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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and other agencies. 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.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) BSL-4 GLP Test &amp; Evaluation</p> <p><b>Description:</b> Clinical Studies</p> <p><b>FY 2020 Plans:</b> Continue to 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>FY 2021 Plans:</b> Continue to conduct a minimum of one GLP BSL-4 T&amp;E medical countermeasure non-human primate study 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>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.</p>	6.094	5.734	3.826
<p><b>Title:</b> 2) CBIPR-BSL4 RIID</p> <p><b>Description:</b> Performs T&amp;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</p> <p><b>FY 2021 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. Provides support for operational availability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>	-	-	2.498
<p><b>Title:</b> 3) CBIPR - ADM</p> <p><b>Description:</b> Establish proven enabling manufacturing technologies at the DoD ADM Capability Building.</p> <p><b>FY 2020 Plans:</b></p>	-	8.000	8.126

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Initiate tech transfer and enhancement of manufacturing technologies to support MCM development against biological threats. <b>FY 2021 Plans:</b> Continue tech transfer and enhancement of manufacturing technologies to support MCM development against biological threats. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.				
<b>Title:</b> 4) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B) <b>Description:</b> Anti-Bacterial Therapeutics		1.460	-	-
<b>Title:</b> 5) Medical Countermeasure Platform Technologies (MCMPT) <b>Description:</b> Rapid Response <b>FY 2020 Plans:</b> Continue development of a rapid response capability. <b>FY 2021 Plans:</b> Continue development of a rapid response capability. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Efforts will be progressing into manufacturing FY21.		9.892	7.704	13.104
<b>Title:</b> 6) MCMPT <b>Description:</b> ADAMANT <b>FY 2020 Plans:</b> Closing out ADAMANT BoNT mAbs activities in preparation for transition to advanced developer and ramping up ADAMANT Plague activities. <b>FY 2021 Plans:</b> Continue optimization and development of ADAMANT Plague mAbs to support delivery of a product MCM. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Overall increase due to manufacturing.		18.354	7.189	17.621
<b>Title:</b> 7) MCMPT <b>Description:</b> Vaccine Platform		3.872	1.397	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Complete development efforts for the vaccine platform capability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project terminated in FY 2020. Vaccine efforts ends FY20.</p>			
<p><b>Title:</b> 8) Next Generation Diagnostic System 2 (NGDS 2)</p> <p><b>Description:</b> Chemical Diagnostic System</p> <p><b>FY 2020 Plans:</b> Complete development of prototype for Chemical agent diagnostics.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. Program/project funding transferred to NGDS 2 CHEMDX in FY21.</p>	7.151	0.619	-
<p><b>Title:</b> 9) NGDS 2 Chemical Diagnostics (NGDS 2 CHEMDX)</p> <p><b>Description:</b> Chemical Diagnostic System</p> <p><b>FY 2021 Plans:</b> Complete Technology Maturation and Risk Reduction (TMRR) phase for Chemical agent diagnostics. TMRR will conclude with a Systems Engineering Trade-off Analysis, a Technology Readiness Assessment and a Preliminary Design Review to inform major design parameters culminating in a Beta 2 Prototype technology risk reduction effort.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Program/project funding transferred from NGDS Increment 2.</p>	-	-	2.552
<p><b>Title:</b> 10) Filovirus Vaccine (VAC FILO)</p> <p><b>Description:</b> Assays and nonclinical</p> <p><b>FY 2020 Plans:</b> Complete nonclinical studies for vaccine prototype, and complete support of clinical trial.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed. Program will responsibly shelve development efforts until prototype transition from S&amp;T partners.</p>	5.042	6.303	-
<p><b>Title:</b> 11) VAC FILO</p>	4.191	6.500	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Manufacturing</p> <p><b>FY 2020 Plans:</b> Complete stability testing.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed. Program will responsibly shelve development efforts until prototype transition from S&amp;T partners.</p>			
<p><b>Title:</b> 12) Venezuelan Equine Encephalitis (VAC VEE)</p> <p><b>Description:</b> Non Clinical and Clinical</p> <p><b>FY 2020 Plans:</b> Continue clinical and nonclinical and efforts for multiple candidates prior to competitive selection.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is entering completion and all activities will be closed. Program will responsibly shelve development efforts until prototype transition from S&amp;T partners.</p>	7.727	2.720	-
<b>Accomplishments/Planned Programs Subtotals</b>	63.783	46.166	47.727

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB5: Medical Biological Defense (SDD)	127.933	130.074	86.460	-	86.460	56.868	45.226	68.593	83.282	Continuing	Continuing
• MB7: Medical Biological Defense (Op Sys Dev)	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing
• JM6677: ADVANCED ANTICONVULSANT SYSTEM (AAS)	0.000	3.152	0.000	-	0.000	4.885	8.052	7.862	1.394	Continuing	Continuing
• JM8788: NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)	6.563	4.905	0.970	-	0.970	0.000	0.000	0.000	0.000	0.000	12.438
• JX0005: DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)	0.183	0.173	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.356

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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)**

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• JX0210: DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)	0.975	2.961	2.845	-	2.845	2.760	2.736	2.736	2.736	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

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 a testing capability at the existing and planned new USAMRIID facilities. MCM BSL-4 T&E costs support testing of MCMs against threats that require high-level containment using non-human primates. The period of FY18 and beyond will continue to support the BSL-4 T&E capability. In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities.

CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - BIOSAFETY LEVEL 4 RESEARCH INSTITUTE OF INFECTIOUS DISEASES (CBIPR-BSL4 RIID)

The Medical Countermeasure Systems (MCM) BSL-4 T&E capability continues to utilize and maintain a testing capability at the existing and planned new USAMRIID facilities. MCM BSL-4 T&E costs support testing of MCMs against threats that require high-level containment using non-human primates. The period of FY18 and beyond will continue to support the BSL-4 T&E capability.

CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - ADM

A contract was awarded to Ology Bioservices on 20 March 2013 (then Nanotherapeutics, Inc.) to establish a Department of Defense (DoD) ADM Facility to rapidly develop, approve (through FDA approval), and manufacture MCMs. The contract was structured to be executed in two (2) phases:

Phase 1-Establish, commission and validate (facility(ies)/ equipment) for two (2) advanced development and manufacturing suites that use agile, flexible (single use, disposable), modular and multi-product technologies for MCM advanced development and manufacturing. Both suites must meet Biological Safety Level-3 (BSL-3) standards. Phase 1 was completed on 31 March 2017.

Phase 2-Support and maintain that capability in a state of readiness to support MCM development (under the animal rule as applicable) and manufacturing and assist in training personnel in its use. This includes transition and integration of new technologies, from Pre-Investigational New Drug Application phase with readiness to support simultaneous operations, through FDA licensure. The first sustainment option (POP 2 years) was completed in 2QFY19; the subsequent sustainment option began thereafter and is scheduled for completion in 4QFY20, but can be extended until 2QFY21 if needed.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>
<p><b>COUNTERMEASURES FOR DRUG RESISTANT BACTERIA (CMDR-B)</b></p> <p>The CMDR-B program develops MCMs for Service members for protection against 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 candidate is a transitional product from S&amp;T that showed efficacy against plague, anthrax, and other BW agents. The regulatory approach of the program is to pursue development of products to FDA approval under the Animal Rule. The program will conduct non-human primate studies to confirm efficacy. The performer will develop and submit an IFC package to FDA for emergency use to support the warfighter preparedness against MDR. The performer will submit Supplemental New Drug Application for the therapeutic during the EMD Phase. In FY18 PK study on non-human primates was completed for the plague indication and results were analyzed against threat indication. Continued coordination with FDA for supplemental indication of anthrax based on threat level to the warfighter. In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities.</p> <p><b>MCM PLATFORM TECHNOLOGIES (MCMPT)</b></p> <p>The goal of the MCMPT is to rapidly counter a broad-spectrum of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. 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. A subset of these technologies will be adapted to deliver a rapid response capability to novel and emerging threats. Once established, future programs will be able to leverage these platforms for the development of future medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority (OTA) through the medical OTA consortium.</p> <p><b>NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)</b></p> <p>The NGDS 1 program was a MS A to MS C - acquisition strategy, with MS C approval granted in Dec 2016 for limited production and fielding. NGDS 1 is replacing the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17. NGDS 1 Full Rate Production was approved in Aug 2018.</p> <p>NGDS 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 continued the technology maturation and risk reduction of a man-portable diagnostic capability in FY18 and transitioned to engineering and manufacturing development phase in FY19. NGDS 2 initiated prototyping of a chemical diagnostic capability in FY18. Separate decisions will be utilized to proceed with further development and production for each capability, based on individual determinations of technology maturity to meet user requirements. Development efforts are cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings. NGDS 2 is broken out into NGDS 2 CHEMDx and NGDS 2 MPDS starting in FY21.</p> <p><b>NEXT GEN DIAG 2 CHEMICAL DIAGNOSTICS (NGDS 2 CHEMDX)</b></p> <p>NGDS Increment 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 CHEMDX will provide a lightweight, portable, and simple-to-use diagnostic capability against chemical threat agents to end-users in</p>		

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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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non-laboratory, far-forward environments. NGDS 2 CHEMDX initiated prototyping in FY18 and will conclude prototyping in FY21. NGDS 2 CHEMDX is using an Other Transactions Authority (OTA) agreement to take advantage of nontraditional Defense contractor offerings. NGDS 2 CHEMDX program is broken out from the NGDS Increment 2 program starting in FY21.

**FILOVIRUS (VAC FILO)**

The Filovirus Vaccine Program acquisition strategy develops products for pre-exposure prophylaxis that will offer protection against the threat of Ebola and Marburg viruses, with the initial increment focused on Marburg. The current budget supports responsibly shelving program development efforts until prototype transition from our Science and Technology (S&T) partners. Work to develop and qualify necessary assays is on-going to support successful transitions of potential Marburg and Ebola candidates from S&T. Assays will be used to compare transitioned products in order to have a meaningful down select at Milestone B (MS B). At MS B, the best pre-exposure prophylaxis 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 Food and Drug Administration (FDA) licensed Marburg pre-exposure prophylactic product. 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 FDA and licensure of a Marburg pre-exposure prophylactic product.

**VENEZUELAN EQUINE ENCEPHALITIS VACCINE (VAC VEE)**

The VAC VEE acquisition strategy uses a parallel evaluation of Modified Vaccinia Ankara (MVA) and Virus Like Particle (VLP) vaccine prototypes through Phase I clinical trials to achieve competitive prototyping in the Technology Maturation & Risk Reduction phase and one of these candidates will be selected to fill the gap with the Services until a future S&T candidate is ready for transition into advanced development with a successful Phase 1 clinical trial. Several potential decision points will be used to assess the prototypes at competitive selection from MS B to MS C. The schedule is based on a competitive selection to one prototype at MS C with delivery of a FDA-licensed VEE vaccine. The current S&T efforts do not have a potential candidate with a completed Phase I clinical trial until FY24, therefore the current effort of the MVA and VLP will be the candidates utilized for the MS B down select until a future candidate can be assessed for advanced development. The current candidates are based on development of known mature vaccine platforms with potential to utilize the DoD Advanced Development Manufacturing facility for production. The development efforts will be a Cost Plus and Firm Fixed Price CLINs.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CBIPR-ADM - Enabling Manufacturing Technologies	C/CPFF	Ology : Alachua, FL	0.000	0.000		6.706	Dec 2019	7.380	Dec 2020	-		7.380	Continuing	Continuing	0.000
MCMPT - HW S - Rapid Response	C/CPFF	Ology : Alachua, FL	0.420	5.966	Jul 2019	4.161	Dec 2019	9.328	Dec 2020	-		9.328	Continuing	Continuing	0.000
MCMPT - HW S - Vaccine Platform Development Efforts	C/CPFF	Ology : Alachua, FL	0.000	2.815	Mar 2019	1.002	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - HW S - ADAMANT MCM Development	C/CPFF	Ology : Alachua, FL	0.000	12.847	Jan 2019	7.430	Dec 2019	12.592	Dec 2020	-		12.592	Continuing	Continuing	0.000
NGDS - HW C - NGDS 2 Develop and mature prototypes for Chemical Agent Diagnostics	C/CPFF	MRIGlobal : Palm Bay, FL	1.566	1.678	Dec 2018	0.452	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - NGDS 2 Develop and mature Assays for Chemical Agent Diagnostics	MIPR	US Army Medical Research Institute of Chemical Defense : Fort Detrick, MD	0.038	0.090	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Develop and mature Assays for Chemical Agent Diagnostics	MIPR	US Army Medical Research Institute of Chemical Defense : Fort Detrick, MD	0.000	0.000		0.000		0.032	Dec 2020	-		0.032	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Develop and mature prototypes for Chemical Agent Diagnostics	C/CPFF	MRIGlobal : Palm Bay, FL	0.000	0.000		0.000		0.800	Dec 2020	-		0.800	Continuing	Continuing	0.000
VAC FILO - Non Clinical Studies	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	21.395	0.216	Dec 2018	3.239	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - HW S - Manufacturing	C/CPFF	Various : Various	15.508	0.751	Dec 2018	0.500	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
VAC VEE - Prototypes Phase 1 Clinical Trials	C/CPHF	Various : Various	0.000	6.446	Dec 2018	1.614	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC VEE - Prototypes Non Clinical Comparability Studies	Allot	Various : Various	0.000	0.000		0.670	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC VEE - Manufacturing	Various	TBD : N/A	0.000	0.080		0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			38.927	30.889		25.774		30.132		-		30.132	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
NGDS - ES C - Studies and WIPT Support	C/CPFF	John Hopkins University : Laurel, MD	0.282	0.168	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - ES C - Studies and WIPT Support	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	0.000		0.000		0.300	Dec 2020	-		0.300	Continuing	Continuing	0.000
VAC FILO - ES S - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	Various	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	3.408	0.020	Dec 2018	0.040	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			3.690	0.188		0.040		0.300		-		0.300	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
BSL4 GLP T&E - DTE SB - T&E Facility	MIPR	US Army Medical Research Institute of	30.220	4.410	Dec 2018	4.682	Dec 2019	2.777	Dec 2020	-		2.777	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
		Infectious Disease (USAMRIID) : Fort Detrick, MD													
CBIPR-BSL4 RIID - DTE C - DTE SB - T&E Facility	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	0.000		0.000		2.498	Dec 2020	-		2.498	Continuing	Continuing	0.000
VAC FILO - OTHS SB - Testing, Evaluation, and Clinical Trials	MIPR	Walter Reed Institute of Research : Washington, DC	41.819	1.260	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - OTE C - Assay Development, Testing and Evaluation	C/CPFF	Various : Various	16.259	1.163	Dec 2018	1.014	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - OTHS SB - Clinical Trials	C/CPIF	Various : Various	1.650	1.001	Dec 2018	3.482	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			89.948	7.834		9.178		5.275		-		5.275	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - Program Management (OPETS)	C/FFP	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	1.107	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSL4 GLP T&E - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.019	Dec 2018	0.545	Dec 2019	0.544	Dec 2020	-		0.544	Continuing	Continuing	0.000
BSL4 GLP T&E - Program Management (JPdM MCS)	Various	JPEO Chem/Bio Defense (JPEO-	0.000	0.558	Dec 2018	0.507	Dec 2019	0.505	Dec 2020	-		0.505	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		CBD) : Aberdeen Proving Ground, MD													
CBIPR-ADM - PM/MS C - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.560	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBIPR-ADM - PM/MS C - Program Management Support #2	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.734	Dec 2019	0.746	Dec 2020	-		0.746	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Program Management (Biological Therapeutics)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.332	0.623	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS S - Program Management Support (OPETS)	C/FFP	Various : Various	0.323	0.837	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - PM/MS C Program Management	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	2.602	Dec 2018	2.056	Dec 2019	3.490	Dec 2020	-		3.490	Continuing	Continuing	0.000
MCMPT - PM/MS C - JpDM PRISM Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	1.454	Dec 2018	0.000		3.162	Dec 2020	-		3.162	Continuing	Continuing	0.000
MCMPT - PM/MS S - Management	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.080	2.232	Dec 2018	1.641	Dec 2019	2.153	Dec 2020	-		2.153	Continuing	Continuing	0.000
MCMPT - PM/MS C - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	4.202	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - PM/MS S - Program Management (JPEO) Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.530	1.037	Dec 2018	0.045	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS C - Program Management (Dx) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.215	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS SB - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.647	1.759	Dec 2018	0.041	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS S - Program Management (Dx) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.059	2.204	Dec 2018	0.081	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.179	Dec 2020	-		0.179	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		0.291	Dec 2020	-		0.291	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (ChemDx)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.017	Dec 2020	-		0.017	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Product Management Support	MIPR	Combat Capabilities Development Command (CCDC)	0.000	0.000		0.000		0.228	Dec 2020	-		0.228	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
		Chemical Biological Center : Aberdeen Proving Ground, MD													
NGDS 2 CHEMDX - PM/MS S - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.000		0.705	Dec 2020	-		0.705	Continuing	Continuing	0.000
VAC FILO - Program Management (JPM) Support	Various	Various : Various	3.266	1.015	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - Program Management (JPdM MCS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	7.180	0.444	Dec 2018	2.683	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - Program Management (JPEO) Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	9.269	2.222	Dec 2018	1.845	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - Program Management (OPETS)	C/FFP	Various : Various	2.500	1.141	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC VEE - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.160	Dec 2018	0.094	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC VEE - Program Management (JPEO) Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	1.041	Dec 2018	0.342	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			29.186	24.872		11.174		12.020		-		12.020	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	161.751	63.783	46.166	47.727	-	47.727	Continuing	Continuing	N/A





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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 VEE - Stability Testing																												
VAC VEE - Competitive Prototypes - Non-Clinical Studies																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSL4 GLP T&E - T&E - Maintain Bio-Safety Level and Evaluation Capability	1	2019	4	2025
CBIPR-BSL4 RIID - T&E - Maintain Bio-Safety and Evaluation Capability	1	2021	4	2021
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2020	4	2024
CBIPR-ADM - MCM Development and Manufacturing Support	1	2020	2	2023
CMDR-B - Pharmacokinetic Studies	1	2019	4	2019
CMDR-B - Bacterial Therapeutics Core Program Evaluation of BAXDELA	1	2019	4	2019
CMDR-B - Animal Efficacy Studies	1	2020	4	2020
MCMPT - Rapid Response Design, Manufacturing, Testing	1	2019	4	2025
MCMPT - MCM Optimization Phase Design, Manufacturing, Testing	1	2019	4	2023
MCMPT - Vaccine Platform Design, Manufacturing, Testing	2	2019	4	2020
MCMPT - ADAMANT Plague	2	2019	4	2024
NGDS 2 CHEMDX - ChemDx TMRR	1	2019	2	2021
NGDS 2 CHEMDX - ChemDx MS B	2	2021	2	2021
VAC FILO - Non Clinical Efficacy and Safety Studies	1	2019	4	2020
VAC FILO - Manufacturing Stability Testing	1	2019	4	2020
VAC FILO - VAC Filo Clinical Trial Phase II	1	2019	4	2020
VAC VEE - Competitive Prototypes - Phase 1 Clinical Trials (Cont from VAC WEVEE)	1	2019	4	2020
VAC VEE - Stability Testing	1	2019	4	2020
VAC VEE - Competitive Prototypes - Non-Clinical Studies	1	2019	4	2020

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
MC4: Medical Chemical Defense (ACD&P)	-	3.685	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.685
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.

Efforts included in this project are:

- (1) Emerging Threats (EMRT)
- (2) Improved Nerve Agent Treatment System (INATS)

EMRT program is developing and fielding of FDA-approved therapeutic medical countermeasures (MCMs). The purpose of the MCM is to provide therapeutic benefits to the Joint Service warfighter against operational exposures to the opioid class of pharmaceutical-based agents (PBAs) as a high priority. The EMRT program is called the Rapid Opioid Countermeasure System (ROCS) in FY20 MC5. ROCS will use MC5 funds for advanced development of a 10 mg naloxone autoinjector as a rescue therapeutic to treat against operational opioid exposure.

The 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 treat current and emerging threats and (2) 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).

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) Emerging Threats (EMRT) - Prototype Development	1.735	-	-
<b>Description:</b> Regulatory			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 2) Improved Nerve Agent Treatment System (INATS) <b>Description:</b> Clinical - Oxime	1.344	-	-
<b>Title:</b> 3) INATS <b>Description:</b> Manufacturing - Oxime	0.300	-	-
<b>Title:</b> 4) INATS <b>Description:</b> Nonclinical - Oxime	0.306	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	3.685	-	-

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

<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MC5: Medical Chemical Defense (SDD)	43.648	60.220	54.392	-	54.392	52.813	31.441	15.215	15.019	Continuing	Continuing
• JM6677: ADVANCED ANTICONVULSANT SYSTEM (AAS)	0.000	3.152	0.000	-	0.000	4.885	8.052	7.862	1.394	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

EMERGING THREAT CHEMICAL THERAPEUTICS (EMRT)

The EMRT program transitioned to Rapid Opioid Countermeasure System (ROCS) in FY20 using MC5 funds.

EMRT program is developing and fielding of FDA-approved therapeutic medical countermeasures (MCMs). The purpose of the MCM is to provide therapeutic benefits to the Joint Service warfighter against operational exposures to the opioid class of pharmaceutical-based agents (PBAs) as a high priority. The first increment of the EMRT program will develop a naloxone autoinjector as a rescue treatment that will counteract the adverse effects from exposure to opioids. The program will use MC5 funds in FY20 to develop and gain FDA approval the autoinjector.

IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (MC4) program concludes as INATS in FY19.

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 centrally acting formulation development efforts, nonclinical toxicology and efficacy studies and clinical safety studies. In the Engineering and Manufacturing Development (EMD) phase, the Government will engage with commercial partner(s) to ensure that INATS CA development and manufacture is in accordance with Food and Drug Administration (FDA) regulations. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities, resulting in only the INATS CA component being pursued.

The INATS (MC7) line initiates in FY20 and transitions to INATS CA (MC7) in FY21. INATS (MC7) will support the modernization of Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP) using contract actions to extend operational shelf-life and generate data to expand storage temperature conditions.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
EMRT - HW C - Emerging Threats	C/CPFF	kaleo : Richmond, VA	0.000	1.462	Jul 2019	0.000		0.000		-		0.000	0.000	1.462	0.000
INATS - HW C - CMC Manufacturing of trial material	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.849	0.100	Dec 2018	0.000		0.000		-		0.000	0.000	0.949	0.000
<b>Subtotal</b>			0.849	1.562		0.000		0.000		-		0.000	0.000	2.411	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
INATS - DTE C - Cause of Death studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	2.041	0.023	Nov 2018	0.000		0.000		-		0.000	0.000	2.064	0.000
INATS - DTE C - Oxime Phase 1 Clinical Trial	C/CPFF	Battelle Memorial Institute : Columbus, OH	4.771	1.238	Nov 2018	0.000		0.000		-		0.000	0.000	6.009	0.000
<b>Subtotal</b>			6.812	1.261		0.000		0.000		-		0.000	0.000	8.073	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
EMRT - Program Management (OPETS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.185	Dec 2018	0.000		0.000		-		0.000	0.000	0.185	0.000
EMRT - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.088	Nov 2018	0.000		0.000		-		0.000	0.000	0.088	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
EMRT - Prototype Development				■																								
INATS - Nonclinical Studies - Oxime	■	■	■	■																								
INATS - Phase 1 Clinical Trial - Oxime	■	■	■	■																								
INATS - Clinical Trial Material Manufacturing - Oxime	■																											
INATS - Rat/Rabbit Cause of Death Studies - Oxime	■	■	■	■																								

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMRT - Prototype Development	4	2019	4	2019
INATS - Nonclinical Studies - Oxime	1	2019	3	2019
INATS - Phase 1 Clinical Trial - Oxime	1	2019	4	2019
INATS - Clinical Trial Material Manufacturing - Oxime	1	2019	1	2019
INATS - Rat/Rabbit Cause of Death Studies - Oxime	1	2019	3	2019

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
TE4: Test & Evaluation (ACD&P)	-	6.293	5.162	4.107	-	4.107	2.822	2.823	2.824	1.601	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Chemical Biological Material Assessment Infrastructure (CBMAI) addresses test infrastructure needs with improvements, modifications, and/or new critical test capabilities for chemical, biological, and emerging threat products across the CBDP. The CBMAI funding (BA4-5) is required to provide existing and future test fixtures and methodology to support advanced development test and evaluation intended to meet a changing threat regardless of the test site/location. These activities support current PoRs (e.g., UIPE FoS, NBCRV SSU, etc.) as well as future PoRs such as interdependent contamination mitigation (C3PO, WADS, SEDS), future protective mask programs (i.e., M50 Tech Refresh), remote detection (air to ground/C-SIRP) and integrated early warning (IEW).

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) CBMAI</p> <p><b>Description:</b> Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners.</p> <p><b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2021 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters. Major developmental programs are ending in FY20, to include the Test Grid and OADMS, therefore funding decreases in FY21.</p>	0.773	1.802	0.850
<p><b>Title:</b> 2) CBMAI</p> <p><b>Description:</b> CBMAI conducts requirements analysis to ensure the availability of needed test infrastructure to meet POR testing and milestone schedules. Conduct studies of the capabilities and limitations of existing infrastructure and methodologies to align with POR test requirements. Initiate requirements generation and early development of new test infrastructure to support POR test requirements.</p> <p><b>FY 2020 Plans:</b></p>	5.520	3.360	3.257

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Continue to study and prioritize future program requirements and test infrastructure needs. Develop equipment and methodologies to provide improved detection and protective ensemble performance data. Develop equipment and technologies to modernize infrastructure to support emerging requirements for early warning/standoff detection systems.			
<b><i>FY 2021 Plans:</i></b> Continue to study and prioritize future program requirements and test infrastructure needs. Initiate the development of a chemical standoff detection test fixture, and multiple test fixtures providing accurate protective ensemble performance data.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.			
<b>Accomplishments/Planned Programs Subtotals</b>	6.293	5.162	4.107

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TE5: Test & Evaluation (SDD)	8.792	7.684	6.352	-	6.352	5.878	5.879	5.879	6.371	Continuing	Continuing
• TE7: Test & Evaluation (Op Sys Dev)	6.179	5.403	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.582

**Remarks**

**D. Acquisition Strategy**

CHEMICAL BIOLOGICAL MATERIEL ASSESSMENT INFRASTRUCTURE (CBMAI)

CBMAI 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. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CBMAI - HW S - Multi Commodity Agent Chamber (MCAC)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	1.090	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - HD Sensor	C/CPFF	MRIGlobal : Kansas City, MO	0.000	1.212	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW C - Swatch Test Fixtures	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.600	Oct 2020	-		0.600	Continuing	Continuing	0.000
CBMAI - HW C - Glove Test Fixtures	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.500	Oct 2020	-		0.500	Continuing	Continuing	0.000
CBMAI - HW C - Remote Detection Chemical Test Fixture	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.000		0.800	Oct 2020	-		0.800	Continuing	Continuing	0.000
CBMAI - HW C - Wearable MeS Sensor	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.000		0.500	Oct 2020	-		0.500	Continuing	Continuing	0.000
CBMAI - HW S - TI Analysis and Requirements	C/CPFF	Various : Various	0.000	0.932	Feb 2019	3.360	Dec 2019	0.857	Dec 2020	-		0.857	Continuing	Continuing	0.000
CBMAI - HW S - Real Time Man in Simulant Test (MIST) Sensor	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.564	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Government/Contractor SE & Technical Management Team	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	1.508	Dec 2018	0.774	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	5.306		4.134		3.257		-		3.257	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CBMAI - TD/D S - TECA	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.075	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.075		0.000		0.000		-		0.000	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CBMAI - WSLAT Decon Study	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.214	Apr 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.214		0.000		0.000		-		0.000	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CBMAI - PM/MS C - IPT Support/Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.698	Dec 2018	1.028	Dec 2019	0.850	Dec 2020	-		0.850	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.698		1.028		0.850		-		0.850	Continuing	Continuing	N/A

			Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>			0.000	6.293	5.162	4.107	-	4.107	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program			<b>Date:</b> February 2020
<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)	

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CBMAI - Real Time MeS Sensor	██████████																											
CBMAI - Whole System Live Agent Test (WSLAT) System	████████████████████																											
CBMAI - Swatch Test Fixtures	██																											
CBMAI - Glove Test Fixtures					██																							
CBMAI - Remote Detection Chemical Test Fixture					██																							
CBMAI - Wearable MeS Sensor					██																							
CBMAI - Test Infrastructure Analysis & Requirements (TIA & R)	██																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CBMAI - Real Time MeS Sensor	1	2019	3	2020
CBMAI - Whole System Live Agent Test (WSLAT) System	1	2019	1	2022
CBMAI - Swatch Test Fixtures	1	2019	3	2023
CBMAI - Glove Test Fixtures	1	2020	3	2023
CBMAI - Remote Detection Chemical Test Fixture	1	2020	3	2023
CBMAI - Wearable MeS Sensor	1	2020	2	2024
CBMAI - Test Infrastructure Analysis & Requirements (TIA & R)	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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> TM4 / Techbase Medical Defense (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TM4: Techbase Medical Defense (ACD&P)	-	0.000	0.000	0.000	-	0.000	2.995	2.995	2.995	0.998	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Project TM4 supports early-phase clinical development of vaccines and therapeutic drugs to provide safe and effective medical defense against validated biological threat agents and emerging infectious disease biothreats including bacteria, toxins, and viruses. This effort reduces programmatic risk of failure in the advanced development phase by generating clinical and supporting non-clinical safety, tolerability and toxicity data for candidate vaccines and therapeutic drugs prior to transition to System Development & Demonstration.

Individual efforts in this project include:

- Supports the advanced development of medical countermeasures to include prophylaxes, pretreatments, antidotes and therapeutic drugs against identified and emerging biological warfare threat agents.
- Demonstration of human safety and tolerability prior to entry of candidate vaccines and therapeutics into advanced development, supporting the preparation of technical data packages that conform to 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.
- In addition, this project supports innovative biotechnology approaches to advance medical systems designed to rapidly identify, diagnose, prevent, and treat emerging biological threats whether naturally occurring or engineered.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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> TT4 / Technology Transition (ACD&P)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TT4: Technology Transition (ACD&P)	-	0.000	0.000	0.577	-	0.577	0.866	1.143	1.443	1.443	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project (TT4) validates high-risk/high-payoff technologies and their respective concepts-of-operations for significant improvement to 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 from laboratory experiments to acquisition programs through risk reduction, 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 either be left in place for extended user evaluations, accepted into 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 funds efforts to enhance technology transition for two Advanced Technology Demonstration (ATD) areas: Integrated Early Warning (IEW), and Integrated Layered Defense (ILD). The IEW ATD family of products achieve enhanced command and control decision making capabilities as a result of a combined and orchestrated family of chemical and biological defense systems deployed on various platforms in strategic locations. The ILD ATD family of products achieve solutions for capability gaps across medical and non-medical commodity areas to enable warfighter survival and rapid recovery in CBRN environments.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Techbase Technology Transition (ACD&P)	-	-	0.577
<b>Description:</b> Integrated Early Warning (IEW) and Integrated Layered Defense (ILD) ATD Transition: This project (TT4) validates high-risk/high-payoff technologies and their respective concepts-of-operations for significant improvement to Warfighter capabilities in preparation for transition of mature technologies to advanced development programs requiring chemical and biological (CB) defense technologies.			
<b>FY 2021 Plans:</b> Facilitate transitions of Integrated Early Warning and Integrated Layered Defense products to CBRN-Information Systems (CBRN-IS)/Sensor Integration on Robotic Platforms (C-SIRP), Dismounted Reconnaissance Sets, Kits and Outfits (DRSKO), and Joint Project Manager Protection (JPM-P) Programs of Record.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Increase due to transition of demonstration activities from budget activity 3 (RDT&E Project, TT3 Techbase Technology Transition).			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	0.577

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> TT4 / Technology Transition (ACD&P)

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>			<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• TT3: Technology Transition (ATD)	9.577	10.982	10.416	-	10.416	10.121	9.842	9.540	9.540	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

TECHBASE TECH TRANSITION (TECHTRAN)

Advanced Technology Demonstrations (ATDs) exploit mature and maturing technologies to solve important military problems. ATDs emphasize technology integration, operational utility assessment, and transition of operational prototypes for practical use. The goals of efforts under the TT4 project are to provide a prototype capability to the Warfighter and support the evaluation of that capability in operationally-relevant field environments. This will allow Warfighters to evaluate the capabilities in real military exercises and at a scale sufficient to fully assess military utility. The Defense Threat Reduction Agency (DTRA) will fund DoD laboratories and DoD Federally Funded Research Development Centers (FFRDCs) through the Military Interdepartmental Purchase Request (MIPR) in accordance with the Economy Act in order to conduct operational evaluation of technology solutions for Integrated Early Warning (IEW) and Integrated Layered Defense (ILD) ATD efforts. Upon completion of efforts under this project, operational prototypes of Technology Readiness Level (TRL) 6 or TRL 7 with documented operational utility assessment outcomes will be transitioned to Service stakeholders and programs of record to support rapid acquisition and fielding decisions.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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> TT4 / Technology Transition (ACD&P)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
TECHTRAN - IEW and ILD Transition	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.116	0.000		0.000		0.116	Nov 2020	-		0.116	Continuing	Continuing	0.000
<b>Subtotal</b>			0.116	0.000		0.000		0.116		-		0.116	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
TECHTRAN - IEW and ILD Transition	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.412	0.000		0.000		0.411	Nov 2020	-		0.411	Continuing	Continuing	0.000
<b>Subtotal</b>			0.412	0.000		0.000		0.411		-		0.411	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
TECHTRAN - PM/MS S - IEW and ILD Transition	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.050	Nov 2020	-		0.050	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		0.000		0.050		-		0.050	Continuing	Continuing	N/A



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> TT4 / <i>Technology Transition (ACD&amp;P)</i>

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
TECHTRAN - IEW ATD																												
TECHTRAN - ILD ATD																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> TT4 / <i>Technology Transition (ACD&amp;P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TECHTRAN - IEW ATD	1	2021	2	2021
TECHTRAN - ILD ATD	3	2021	4	2024

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	344.745	385.047	319.976	-	319.976	211.037	137.895	141.740	157.648	Continuing	Continuing
CA5: <i>Contamination Avoidance (SDD)</i>	-	102.827	127.833	128.954	-	128.954	64.217	32.247	28.065	29.730	Continuing	Continuing
CM5: <i>Homeland Defense (SDD)</i>	-	4.775	10.146	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.921
CO5: <i>Collective Protection (SDD)</i>	-	8.781	7.272	7.885	-	7.885	2.983	0.000	0.000	0.000	0.000	26.921
DE5: <i>Decontamination (SDD)</i>	-	15.399	7.989	16.954	-	16.954	9.729	5.074	9.793	9.317	Continuing	Continuing
IP5: <i>Individual Protection (SDD)</i>	-	10.597	12.663	12.960	-	12.960	12.858	12.796	8.963	8.436	Continuing	Continuing
IS5: <i>Information Systems (SDD)</i>	-	21.993	21.166	6.019	-	6.019	5.691	5.232	5.232	5.493	Continuing	Continuing
MB5: <i>Medical Biological Defense (SDD)</i>	-	127.933	130.074	86.460	-	86.460	56.868	45.226	68.593	83.282	Continuing	Continuing
MC5: <i>Medical Chemical Defense (SDD)</i>	-	43.648	60.220	54.392	-	54.392	52.813	31.441	15.215	15.019	Continuing	Continuing
TE5: <i>Test &amp; Evaluation (SDD)</i>	-	8.792	7.684	6.352	-	6.352	5.878	5.879	5.879	6.371	Continuing	Continuing

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

The projects in this program element (PE) support the development, build, and test of products to verify that all operational and derived requirements have been met, and to support production or deployment decisions. The activities include mature system development, integration, and demonstration to support Milestone C decisions, and conducting operational test and evaluation of production representative articles.

Individual projects include:

- Contamination Avoidance (CA5): system development of reconnaissance, detection, identification, and warning systems that minimize chemical, biological, and radiological (CBR) contamination and prevent further cross-contamination during operations.

- Homeland Defense (CM5): system development of common analytical laboratory system capabilities to conduct on-site analysis of any unknown sample and test potential life-threatening substances.

- Collective Protection. (CO5): system development of collectively protected systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable enabling mission accomplishment in spaces safe from the effects of CBR contamination.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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>CHEMICAL/BIOLOGICAL DEFENSE (EMD)</i>
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- Decontamination (DE5): system development of Contamination Mitigation (ConMit) systems utilizing solutions that will remove/eliminate and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment.
  
- Individual Protection (IP5): system development of the next generation protective ensembles (e.g., suits, boots, and gloves) and respiratory and ocular protection equipment (e.g., protective masks) which enable the Joint Force to operate in a contaminated CBR environment with little or no degradation to his/her performance.
  
- Information Systems (IS5): system development of information architectures, applications, and cybersecurity hardening for shaping the battlespace against CBR threats.
  
- Medical Biological Defense (MB5): product development of medical biological countermeasure platform technologies, medical biological countermeasures (vaccines and therapeutics), reagents, assays, and diagnostic equipment to provide an effective capability for medical defense against biological warfare agent threats facing U.S. Forces in the field.
  
- Medical Chemical Defense (MC5): product development of medical materiel and other medical equipment items (e.g., diagnostic equipment, prophylactic, pre-treatment, and therapeutic drugs, and individual/casualty decontamination compounds) necessary to provide an effective capability for medical defense against chemical warfare agent threats facing U.S. Forces in the field.
  
- Test and Evaluation (TE5): critical test capabilities, planning, and infrastructure improvements/modifications necessary to evaluate CBRN Defense systems in realistic operating environments.

The projects in this PE support the engineering and manufacturing development phase of the Department of Defense (DoD) acquisition system and are therefore correctly placed in Budget Activity 5.

<b>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2019</u></b>	<b><u>FY 2020</u></b>	<b><u>FY 2021 Base</u></b>	<b><u>FY 2021 OCO</u></b>	<b><u>FY 2021 Total</u></b>
Previous President's Budget	358.608	384.047	293.026	-	293.026
Current President's Budget	344.745	385.047	319.976	-	319.976
Total Adjustments	-13.863	1.000	26.950	-	26.950
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	0.000	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	11.000			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-4.750	-			
• SBIR/STTR Transfer	-9.113	-			
• Other Adjustments	0.000	-	26.950	-	26.950

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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Chemical and Biological Defense Program Date: February 2020

<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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**Change Summary Explanation**

Funding: FY19 (-\$4.750 Million): Reprogrammings to (-\$2.750 Million) support CBDP Defense Finance and Accounting System transactions and Financial Improvement & Audit Readiness and (-\$2.000 Million) align filtration systems efforts to advanced technology development.

FY19 (-\$9.113 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+\$11.000 Million): Congressional Add for Smallpox antiviral post-exposure prophylaxis.

FY20 (-\$10.000 Million): Congressional Directed Reductions to the Mounted Manned Platform Radiological Detection System, the Common Analytical Laboratory System, the Software Support Activity and other system development & demonstration programs.

FY21 (+\$26.950 Million): The FY21 funding request was reduced during the Defense-Wide Review (DWR) to account for programs being terminated or restructured (-\$80.081 Million); Departmental economic adjustments (-\$0.281 Million); and program increases to mitigate risk in the areas of detection, protection and hazard mitigation; to chemical agent detection and biological detection programs, next generation diagnostic programs, and protection programs (+\$107.312 Million).

Schedule: N/A

Technical: Provides for critical new start program Forward Area Mobility Spray - System (FAMS-S).

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (SDD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CA5: Contamination Avoidance (SDD)	-	102.827	127.833	128.954	-	128.954	64.217	32.247	28.065	29.730	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.

Efforts included in this Project are:

- (1) Mounted Manned Platform Radiological Detection System (MMPRDS)
- (2) Mounted Enhanced Radiac Long Range Imaging Networkable (MERLIN)
- (3) Aerosol & Vapor Chemical Agent Detector (AVCAD)
- (4) Multi-Phase Chemical Agent Detector (MPCAD)
- (5) Proximate Chemical Agent Detector (PCAD)
- (6) CBRN Sensor Integration on Robotics Platforms (CSIRP)
- (7) Enhanced Maritime Biological Detection (EMBD)
- (8) the Global Biosurveillance Technology Initiatives (GBTI)
- (9) Joint Biological Tactical Detection System (JBTDSD)
- (10) Joint Handheld Bio-Agent Identifier (JHBI)
- (11) Joint Nuclear Biological Chemical Radiological System (JNBCRS) 1, also known as Stryker Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRV SS)
- (12) Non-Traditional Agent (NTA) Defense Support, and
- (13) the Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA)

The MMPRDS program includes two sets of mounted radiological and nuclear sensors: the MERLIN and the Vehicle Integrated Platform Enhanced Radiac (VIPER), both of which originate with technology transitions from the Defense Threat Reduction Agency (DTRA). MMPRDS will sunset at the end of FY20. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities, resulting in only the MERLIN program (Project Number CA5) being pursued.

MERLIN is a set of externally mounted sensors used in joint operations on the Stryker NBCRV Sensor Suite Upgrade with the potential for integration on other Army platforms within the formation. The system supports manned and unmanned platform-mounted reconnaissance and surveillance of radiological and nuclear hazards at standoff distances. It is the first and only standoff radiological and nuclear detection capability for the Army; all previously fielded detectors require platforms to travel dangerously close to hazardous areas to detect radiological threats, which puts manned platform crews at risk of radiation exposure and presents contamination issues for the vehicle (be it manned or unmanned). The MERLIN funding lines in FY21 and beyond support integration of the MERLIN system designed for the NBCRV.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> CA5 / <i>Contamination Avoidance (SDD)</i>

AVCAD will fill critical gaps in current chemical sensor capabilities in the areas of aerosol Chemical Warfare Agent detection, and detection of specific advanced threat agents/Non-Traditional Agents (NTAs). The AVCAD will also detect residual vapors to prevent/mitigate health effects associated with low concentration exposures. The U.S. Military Departments view the AVCAD as a high-priority program and will use the system to support their missions, which include monitoring, collective protection, base defense, decontamination, unmasking, reconnaissance, and shipboard and aviation platform chemical detection.

The MPCAD is two-man portable system that will conduct near real-time, near-laboratory grade analysis of solid, liquid, and vapor samples collected by the operator in a presumptively contaminated area. The MPCAD results will support the Commander's tactical and operational decisions regarding maneuver, protection, decontamination, and treatment measures. The Army and Marine Corp will employ MPCAD in Dismounted Reconnaissance and Site Assessment missions to substantiate presumptive detector results. The Air Force will employ the MPCAD to support Post-Event Reconnaissance in support of Reconnaissance and Surveillance missions by monitoring the environment at airbases after a chemical release. The Air Force will continuously monitor contaminated areas for chronic health effects levels through analysis of samples from collectors deployed at the contamination site and brought back to the analyzer for identification and quantification. This information will support commander decisions to determine Mission Oriented Protective Posture (MOPP) levels and eventual termination of cordon restrictions. In FY20, MPCAD is continuing testing to support EMD development. In FY21, MPCAD will complete the EMD phase and prepare for Milestone C / LRIP decision in FY22.

The PCAD provides the Joint Services a handheld capability to locate and detect trace amounts of NTA liquids and a chemical capability for solid surface detection. Efforts to mature technologies during Technology Maturation Risk Reduction (TMRR) phase resulted in systems that were too heavy and cumbersome to use. Program office is working with users and JSTO to identify technologies to mature that may meet the users' needs for a hand held, non-contact, areal detection system. Concurrently with the PCAD TMRR efforts, Combat Capabilities Development Command (CCDC) Chemical Biological Center (CBC) was exploring the use of adapting the Joint Chemical Agent Detector (JCAD) to detect explosives. A JCAD is inserted into a cradle that has a heated inlet and modified library to detect explosives. The effort was expanded for the system to detect NTAs, and Pharmaceutical Based Agents (PBAs) and is called JCAD Solid/Liquid Adapter (SLA). The JCAD SLA kit is planned to be added to the M4A1 JCAD program as an Additional Authorized List (AAL) item. In FY20 the JCAD SLA will use the JCAD BA7 line.

CSIRP is a prototyping and fielding effort that will miniaturize and integrate modular CBRN sensors with Unmanned Air Systems (UAS) and Unmanned Ground Vehicles (UGV) Programs of Record (PORs). CSIRP will provide situational awareness across the echelons of command in order to enable freedom of maneuver and action on the battlefield. An integrated CSIRP capability will exploit advances in machine learning and autonomy. Additional capabilities include sensing and communication, timely and accurate detection, warning and reporting of CBRN hazards. This reduces risk at tactical and operational echelons in mounted and dismounted configurations. CSIRP gives the Joint Force an opportunity to enhance capabilities and maintain operational advantage in multi domain operations.

The EMBD is the Navy's automated biological point detection, collection and identification system. EMBD replaces/upgrades the 135 Joint Biological Point Detection Systems (JBPDS) currently fielded to the Navy and provides 40 systems for new construction ships. EMBD improves detection sensitivity providing the Navy the ability to "detect to inform" reducing the number of contaminated ships during a biological warfare agent attack and minimizing sailor casualties. EMBD reduces false alarm rates, modernizes the computing architecture and increases reliability and sailors confidence in the system. These improvements decrease fleet O&S costs, and reduces the obsolescence issues with current biological detection capability. The EMBD program will test, produce, integrate and field a lower cost biological point

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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 (SDD)
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detection system. In FY20, EMBD will complete EMD (Engineering and Manufacturing Development) DT/OT (Developmental Testing/Operational Testing) and move to Milestone C.

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. In FY19, GBTI will close. The Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) will track projects of mutual interest, formerly under GBTI, with the Chemical Biological Defense Program. The Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) an initiative under Defense Biological Product Assurance Program (DBPAO) will leverage the investments made under GBTI. The (TARMAC) effort will transition to the Defense Biological Products Assurance Program (DBPAP) project MB5 line in FY20.

The JBTDS is the first tactical lightweight, low-cost biological surveillance system to detect, collect, and identify Biological Warfare Agent (BWA) aerosols. JBTDS components are man-portable, battery-operable and easy to employ by any military user. JBTDS provides notification of a hazard and enhances battle space awareness to protect and preserve the forces and is capable of archiving a sample for follow up analysis. When networked, JBTDS augments existing biological detection systems providing a theater-wide array capable of biological detection, identification and warning to support time sensitive force protection decisions. The JBTDS provides surface sampling capability which interfaces with the JBTDS identifier to support sensitive site exploitation missions. In FY20, JBTDS will complete development of components and deliver systems for record test and evaluation.

The 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 JBTDS program and transitioned to its own funding line in FY18. JHBI will provide two 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 eight or more bio-agents at the point of need. JHBI 1 is anticipated to serve as a supplemental capability to the BioFire RAZOR with JHBI 2 fielding the complete replacement of the RAZOR by FY20.

The JNBCRS 1, including the Styker NBCRV SSU, provides maneuver formations the ability to conduct mounted reconnaissance and surveillance missions of CBRN named areas of interest (NAIs). The NBCRV SSU will answer the commander's priority intelligence requirements (PIR), and facilitate proactive risk-based decisions to ensure freedom of action and survivability. A modern and capable NBCRV SSU is a critical component for Joint Force success when operating in the complex CBRN environment. Operating with combat vehicles fighting against increasingly capable and determined enemies requires like capability with regard to protection, mobility, and lethality. The NBCRV SSU will accomplish this by integrating the capability for command and control of unmanned systems with CBRN payload. The NBCRV SSU will provide a CBRN detection, tipping and queuing system to accomplish desired standoff distances to keep the warfighter out of harm's way and reduce sustainment costs over the current system. A Chemical Surface Detector (CSD) will be developed to replace the Dual Wheel Sampling System to increase maneuver speed when conducting NBC missions and increase reliability. This schedule was accelerated from the previous schedule based on the maturity of the sensor and guidance from the Chief of Staff of the Army. In FY20, NBCRV SSU program will develop a prototype of integrated sensors for demonstration in Joint Warfighter Assessment 2020.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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The NTA Defense program is the lead for DoD, Interagency, and international work pertaining to Pharmaceutical Based Agents (PBAs) and other emerging threats. The NTA Defense program assesses existing and new portfolio capabilities against PBAs and other emerging threats to develop dedicated initiatives and projects to transition information, technologies, and capabilities into acquisition programs across all non-medical commodity areas. System prototyping, modification, and integration efforts serve to advance capabilities, reduce risk, and provide improved knowledge for decision making.

The ROSETTA is a modernization effort to provide a higher confidence chemical liquid hazard detection ticket in the currently fielded M256A2 kit for the Warfighter to make timely decisions. These decisions will reduce casualties and improve the combat effectiveness of troops engaged in conflicts involving the use of chemical warfare agents. ROSETTA is based on colorimetric technology and will be eye-readable and ease the Warfighter from current training and operational burden. In addition, the ROSETTA ticket will provide improved hazard detection performance with reduced false alarm rate, potential for increased number of chemicals detected, reduced detection time especially for certain compounds of interest, and potential for integration onto unmanned platforms. The ROSETTA funding will complete the development and testing of the new ROSETTA ticket as well as update the currently fielded M256A2 technical data package via an engineering change proposal (ECP) to create a new M256A3 kit that will be available to all Services. In FY20, ROSETTA will award contract(s) for technical data package testing.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) Mounted Manned Platform Radiological Detection System (MMPRDS)</p> <p><b>Description:</b> Capability Development (Vehicle Integrated Platform Enhanced Radiac (VIPER) and Mounted Enhanced Radiac Long Range Imaging Networkable (MERLIN))</p> <p><b>FY 2020 Plans:</b> Continue system development via industry/contracts with a focus on NBCRV integration. Conduct sensor-level production qualification testing for VIPER and MERLIN, which covers: radiation detection performance, environmental survivability (MIL-STD-810, -461, -464), CBRN survivability, cybersecurity, and human factors. For VIPER, execute operational assessment using Stryker NBCRVs. Conduct production verification testing for both VIPER and MERLIN.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured, resulting in only the MERLIN program being pursued under Project Number CA5. MMPRDS will sunset at the end of FY20.</p>	2.743	6.031	-
<p><b>Title:</b> 2) Mounted Enhanced Radiac Long Range Imaging Networkable (MERLIN)</p> <p><b>Description:</b> Risk reduction efforts for integration onto Army platforms.</p> <p><b>FY 2021 Plans:</b> Release contract to begin design of an integration kit used to mount MERLIN onto Army platforms in the formation.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	-	-	1.294

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred from another funding line. MERLIN will transition from MMPRDS in FY21.				
<p><b>Title:</b> 3) Aerosol &amp; Vapor Chemical Agent Detector (AVCAD)</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Continue EMD development and support various EMD test events to include: Chemical Chamber, Explosive Atmosphere, Maintenance Demonstration, shipboard false alarm, shipboard verification operation, platform integrations, ship shock and vibration, rotary and fixed wing, battlefield contaminant, physical characteristics, MIL-STD 4061, Stryker on the move, coastal operational service life and MIL-STD 810G.</p> <p><b>FY 2021 Plans:</b> Continue EMD development contracts, Systems Engineering, and other IPTs for product development of AVCAD and award LRIP long lead items.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Increase for contract support to complete EMD DT, OA and purchase LRIP Long Leads in FY21</p>		8.269	13.802	19.052
<p><b>Title:</b> 4) Aerosol &amp; Vapor Chemical Agent Detector (AVCAD)</p> <p><b>Description:</b> Test and Evaluation</p> <p><b>FY 2020 Plans:</b> Continue and complete testing for: chemical chamber, explosive atmosphere, maintenance demonstration, shipboard false alarm, shipboard verification operations, platform integration, ship shock and vibration, rotatory and fixed wing integration, battlefield contaminants, physical characteristics, MIL-STD 461. Initiate tests for: Stryker on the move, coastal operational service life, and MIL-STD 810G.</p> <p><b>FY 2021 Plans:</b> Complete chemical chamber testing, conduct multiple test requirements to support operational assessment in support of Milestone C decision.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Increase to complete remainder of EMD Record DT, and execute OA.</p>		1.319	3.980	8.840
<p><b>Title:</b> 5) Aerosol &amp; Vapor Chemical Agent Detector (AVCAD)</p>		1.239	4.027	3.155

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Program Management Support</p> <p><b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2021 Plans:</b> Continue Program Management including program/financial management, costing, travel and overhead</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Decrease due to FY21 labor reallocation to appropriate cost category item under Product Development.</p>			
<p><b>Title:</b> 6) Multi-Phase Chemical Agent Detector (MPCAD)</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Continue up to two EMD contract(s), Government and contracted Integrated Product Development team, systems engineering and IPT Support. Incorporate fixes and purchase 26 test articles at \$150 thousand each to conduct testing and operational assessment to support Milestone C decision.</p> <p><b>FY 2021 Plans:</b> Continue two EMD contract(s), Government and contracted Integrated Product Development team, systems engineering and IPT Support. Conduct Milestone C / Low Rate Initial Production (LRIP) and purchase 15 test articles to conduct LRIP testing and operational testing in FY22.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>	18.359	17.477	18.525
<p><b>Title:</b> 7) Multi-Phase Chemical Agent Detector (MPCAD)</p> <p><b>Description:</b> Testing</p> <p><b>FY 2020 Plans:</b> Complete Library Build and system verification. Initiate and conduct DT Interoperability Test, Cyber Security Vulnerability Test, Chemical Biological Radiological Contamination Survivability (CBRCS) Test, DT Environmental (MIL-STD-810G) Test, DT Explosive Atmosphere Test, DT False (Positive) Alarm Test, DT Natural Desert Environmental Storage Test, DT Electromagnetic Survivability Test, DT/OT Chemicals Test, DT Chemical Chamber Test, DT Maintenance Demonstration, DT Post Field Test,</p>	2.436	13.166	9.931

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
and OT Limited User Test. Continue Other Government Agency (OGA) support of development and testing of MPCAD systems including development of logistics product, test plans, and conducting tradeoff discussions.  <b>FY 2021 Plans:</b> Complete EMD testing started in FY20. Prepare for Milestone C / Low Rate Initial Production (LRIP) and purchase 15 test articles to conduct LRIP testing and operational testing in FY22. Continue OGA support of development and testing of MPCAD systems including development of logistics products, test plans, and reports.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. FY20 funds majority of EMD testing; with FY21 funding completion of testing.				
<b>Title:</b> 8) Multi-Phase Chemical Agent Detector (MPCAD)  <b>Description:</b> Program Management Support  <b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.  <b>FY 2021 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.		2.119	5.189	5.501
<b>Title:</b> 9) Proximate Chemical Agent Detector (PCAD)  <b>Description:</b> EMD Contract & Test and Evaluation		8.296	-	-
<b>Title:</b> 10) CBRN Sensor Integration onto Robotic Platforms (CSIRP)  <b>Description:</b> Product Development, Program Management, Support, Testing and Evaluation  <b>FY 2021 Plans:</b> Continue multiple sensor integration efforts for unmanned ground and air platforms. Continue coordination of demonstrations and test events for end users evaluating the capabilities of the integrated sensors onto the Unmanned Air Systems (UAS)		-	-	11.251

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
and Unmanned Ground Vehicles (UGV). Program management including government system engineering, program/financial management, costing, personnel support, travel and overheard. Initiate evaluation of capability and development of CONOPS. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Advanced Development.				
<b>Title:</b> 11) EMBD <b>Description:</b> Product Development <b>FY 2020 Plans:</b> Continue Government system engineering, program/financial management, and costing in support of the EMBD program. Complete acquisition of systems support for contractor developmental testing (DT) and government DT/ Operational Assessment (OA). Finalize Software (SW) support for test and OA, and finalize SW support and transition to Prime Contractor. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase. EMD completes in FY20		10.452	5.947	-
<b>Title:</b> 12) EMBD <b>Description:</b> Program management support and Test & Evaluation <b>FY 2020 Plans:</b> Continue combat developer, test community and service representation during EMD Phase. Continue program management support including Government system engineering, program/financial management, costing, personnel support, travel and overhead. Initiate and complete logistics demonstration and record testing. Initiate and complete Operation Assessment, Cooperative Vulnerability and Penetration Assessment(CVPA) and Operational Testing. Initiate and complete whole system live agent aerosol testing. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase. OT is only being conducted in FY20		4.123	7.220	-
<b>Title:</b> 13) GBTI <b>Description:</b> 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. In FY19, GBTI will close. The Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) will track projects of mutual interest, formerly under GBTI, with the Chemical Biological Defense Program. The Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) an initiative under Defense Biological		1.100	-	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Product Assurance Program (DBPAO) will leverage the investments made under GBTI. The (TARMAC) effort will transition to the Defense Biological Products Assurance Program (DBPAP) project MB5 line in FY20				
<p><b>Title:</b> 14) JBTDS: Product Development</p> <p><b>Description:</b> EMD Contract &amp; Program Management</p> <p><b>FY 2020 Plans:</b> Continue Government system engineering, program/financial management, and costing in support of the JBTDS program. Complete EMD contract for product development, on-the-move capability testing and development, networking solution, program management support, and product team support.</p> <p><b>FY 2021 Plans:</b> Continue Government systems engineering, program/financial management, and costing in support of the JBTDS program. Continue EMD contract to support testing events. Complete EMD testing and prepare for milestone C decision.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		9.820	6.319	6.610
<p><b>Title:</b> 15) JBTDS: Program Support</p> <p><b>Description:</b> Test &amp; Evaluation</p> <p><b>FY 2020 Plans:</b> Complete sensor calibration. Complete the verification and validation of military utility model/Chemical Biological Attack Consequence Estimator (CBACE). Continue combat developer and test community support. Continue program management support including Government system engineering, program/financial management, costing, personnel support, travel and overhead. Complete production of Biological Warfare Agent (BWA) for testing. Complete live agent and collector characterization developmental testing.</p> <p><b>FY 2021 Plans:</b> Continue combat developer and test support. Complete EMD testing which include Detector/Collector aerosol agent testing, agent identification testing, collector characterization, false alarm testing, Mil-STD, interoperability, outdoor simulant testing, logistics demonstration, operational assessment, cyber adversarial assessment, and modeling and simulation. Continue updates to the JBTDS Test &amp; Evaluation Master Plan (TEMP) to prepare for milestone C decision.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		8.069	8.033	7.452

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Minor change due to routine program adjustments.				
<b>Title:</b> 16) JHBI <b>Description:</b> JHBI three9-Integrated Sample Prep (ISP) system development, developmental testing, and operational assessment.		1.632	-	-
<b>Title:</b> 17) JNBCRS 1 (NBCRV SSU) <b>Description:</b> CBRN Sensor Development and Integration <b>FY 2020 Plans:</b> Continue CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continued government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, and the bulk of integration product development for the acceleration of the program. <b>FY 2021 Plans:</b> Continue CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continue government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, and the bulk of integration product development for the acceleration of the program. Will also perform system level development testing. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.		18.677	24.587	22.144
<b>Title:</b> 18) JNBCRS 1 (NBCRV SSU) <b>Description:</b> Program Management Support <b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. <b>FY 2021 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.		1.374	4.340	4.718
<b>Title:</b> 19) NTA Defense		1.054	2.900	3.679

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Non-Traditional Agent (NTA) Defense program provides assessment, modification, and testing of detection, protection, and decontamination capabilities to protect the Joint Services against emerging threats, with current focus on Pharmaceutical Based Agents (PBAs). Specific efforts include: purchase, test, and assessment of Commercial Off the Shelf/ Government Off the Shelf (COTS/GOTS) equipment; development of prototype equipment for rapid fielding to the Joint Services; update detection equipment survey to include current devices and a web interface for information sharing; and survey equipment and techniques to provide improved sample collection and decontamination of PBAs.</p> <p><b>FY 2020 Plans:</b> Continue COTS detection market survey with new technologies and conduct user evaluation of web interface to provide improved customer usability. Purchase, test, and assess emerging COTS detection equipment and protective equipment materials against PBAs in many forms (solid/liquid/vapor/aerosol/dusty). Test prototype sampling device to allow users to safely handle and test chemical compounds in the field. Modify and test lightweight prototype detector that meets detection requirements while reducing burden on users.</p> <p><b>FY 2021 Plans:</b> Continue purchase of detection prototypes for user assessment. Continue performance assessment of existing capabilities against PBAs. Finalize development of prototype decontamination system.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. FY21 program management funds reallocated within NTA Defense CA5 to this line to align with the appropriate planned funds.</p>			
<p><b>Title:</b> 20) NTA Defense</p> <p><b>Description:</b> Government Integrated Product Team program management and IPT Support.</p> <p><b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters. FY21 program management funds reallocated within NTA Defense CA5 from this line to align with the appropriate planned funds.</p>	-	0.751	-
<p><b>Title:</b> 21) ROSETTA</p> <p><b>Description:</b> Product Development</p>	1.746	4.064	6.802

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>FY 2020 Plans:</b> Continue award of OTA to complete the development and testing of prototype effort.			
<b>FY 2021 Plans:</b> Continue OTA contract and complete testing of ROSETTA prototypes, support operational demonstrations of prototypes and development of technical data package for transition to production.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project schedule. ECP to existing M256A2 kit			
<b>Accomplishments/Planned Programs Subtotals</b>	102.827	127.833	128.954

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

<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• CA4: Contamination Avoidance (ACD&P)	30.879	19.074	10.326	-	10.326	9.853	17.868	14.727	14.294	Continuing	Continuing
• JF0100: JOINT CHEMICAL AGENT DETECTOR (JCAD)	1.698	2.246	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.944
• MC0100: JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)	0.000	0.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.300
• MC0101: CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)	98.231	58.020	47.393	-	47.393	47.009	66.488	85.905	87.775	Continuing	Continuing
• MX0001: JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)	0.000	0.000	0.000	-	0.000	17.492	52.290	69.255	84.824	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

MOUNTED MANNED PLATFORM RADIOLOGICAL DETECTION SYSTEM (MMPRDS)

The MMPRDS program transitioned the VIPER and MERLIN radiological/nuclear sensor technologies from the Defense Threat Reduction Agency (DTRA), rapidly mature the systems with industry, and begin fielding via modification work orders (MWOs) to directly replace legacy mounted capabilities for the Army. Sensor development and testing will continue in FY19-20 using separate Countering Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for VIPER and

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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 (SDD)
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MERLIN. The program plans to award production contracts in FY20 to support production verification testing and initial/rapid fielding to the Joint Nuclear Biological and Chemical Reconnaissance Systems (JNBCRS) sensor suite upgrade platform under conditional materiel release. MMPRDS will sunset at the end of FY20 and transition to a separate line of effort for MERLIN. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities, resulting in only the MERLIN program being pursued.

**MOUNTED ENHANCED RADIAC LONG RANGE IMAGING NETWORKABLE (MMPRDS MERLIN)**

The MERLIN BA5 line covers risk reduction efforts for the possible integration of the MERLIN system onto other Army platforms within the formation. The work will be accomplished through competition using an Other Transaction Authority (OTA) utilizing the Countering Weapons of Mass Destruction (CWMD) OTA.

**AEROSOL VAPOR CHEMICAL AGENT DETECTOR (AVCAD)**

Aerosol & Vapor Chemical Agent Detector (AVCAD) awarded two MS B Engineering and Manufacturing Development (EMD) contracts with production options. The AVCAD program is conducting risk reduction testing with prototypes prior to full EMD DT Record Testing in support of the Milestone C decision. The program intends to conduct P&D phase testing with LRIP units from both vendors if supported by EMD Record Test Data, to promote FRP price competition.

**MULTI-PHASE CHEMICAL AGENT DETECTOR (MPCAD)**

The Multi-Phase Chemical Agent Detector (MPCAD) (formerly NGCD 3) is using a streamlined acquisition strategy. The MPCAD EMD contract(s) are utilizing the Countering Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for EMD and LRIP items. The MPCAD will procure production items through a follow-on CWMD OTA or Federal Acquisition Regulation based contract. The program will develop and validate the systems during EMD utilizing two contractors to increase competition.

**PROXIMATE CHEMICAL AGENT DETECTOR (PCAD)**

The Proximate Chemical Agent Detector (PCAD) (formerly NGCD 2) Analysis of Alternatives (AoA) reassessed the PCAD Capability requirement with each of the Joint Services and determined the state of technologies necessary to meet the user's capability needs are not yet mature. The program will transition back to S&T to further mature technology via a competitive contract in FY21. In the interim, the program office will support the operational test of the JCAD SLA kit and complete the logistical analysis to incorporate the JCAD SLA kit as an Additional Authorized List (AAL) item to the M4A1 JCAD.

**CBRN SENSOR INTEGRATION ON ROBOTIC PLATFORMS (CSIRP)**

CSIRP is a streamlined acquisition effort to rapidly prototype and field capabilities distinct from the traditional acquisition system. CSIRP will provide unmanned CBRN payload prototypes in 2 year prototyping plan cycles based on service requirements. The prototyping plans will utilize a streamlined acquisition process in order to keep pace with industry and the rapid advancement of technologies. The CSIRP strategy is to utilize the rapid prototyping process enabled by the Other Transactional

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> CA5 / <i>Contamination Avoidance (SDD)</i>
<p>Agreements (OTA) contract vehicle. Upon award, the awardees will have up to two years to produce prototype CBRN sensors that are integrated onto service chosen (air and/or ground) platforms. These prototypes will be demonstrated, evaluated and tested by the services as well as laboratories and academia. The most successful will be transitioned to the services for the next steps in acquisition, production and eventual fielding across the services. BA4 funding will provide market research to support the refinement and the building of technologically mature prototypes. BA5 funding will provide demonstrations, testing and operational assessments to support transition decisions to POR or sustained capability of the prototypes.</p>		
<p><b>ENHANCED MARITIME BIOLOGICAL DETECTION (EMBD)</b></p> <p>The Enhanced Maritime Biological Detection (EMBD) program uses a streamlined acquisition strategy and acquired a Milestone B decision in June 2018. EMBD will replace/upgrade 135 Joint Biological Point Detection Systems (JBPDs) in the Navy and provide 40 systems for new construction ships. In July 2018 EMBD awarded a contract through Joint Enterprise Research, Development, Acquisition and Production/Procurement (JE-RDAP) contract for Engineering and Manufacturing Development (EMD) with options for Low Rate Initial Production (LRIP) in FY20.</p>		
<p><b>GLOBAL BIO TECH INITIATIVE (GBTI)</b></p> <p>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 a University of Affiliated Research Center (Johns Hopkins University) to characterize laboratory networks and develop decision-making tools for evaluating potential augmentation of key nodes prior to investment. The GBTI program is sun-setting. FY19 will be the last year of funding.</p>		
<p><b>JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)</b></p> <p>The Joint Biological Tactical Detection System (JBTDS) program awarded a full and open contract to Chemring Sensors and Electronic Systems (CSES) in the 3rd Quarter of FY15 for Engineering and Manufacturing Development (EMD) with options for Low Rate Initial Production (LRIP) and Full Rate Production (FRP). Based on the results at Biological Point System Assessment (BPSA), JBTDS will integrate TacBio II as the detector and Joint Handheld Biological Identifier (JHBI) as the identification capability. These technologies will offer significant production and O&amp;S cost savings.</p>		
<p><b>JOINT HANDHELD BIO-AGENT IDENTIFIER (JHBI)</b></p> <p>The JHBI program will pursue a collaborative accelerated acquisition strategy. JHBI will use commercial items to procure candidate systems from two vendors for further development and fielding. 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 the JHBI program. JHBI transitioned to production in FY20.</p>		
<p><b>JOINT NBC RECONNAISSANCE SYSTEM - STRYKER (JNBCRS)</b></p>		

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> CA5 / <i>Contamination Avoidance (SDD)</i>

Joint Nuclear Biological Chemical Radiological System (JNBCRS), includes the Stryker Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU). The acquisition strategy for the Stryker NBCRV SSU is to integrate mature sensors into the Stryker NBCRV to support Joint Warfighter Assessment 2020 and system level testing. Following the testing and demonstration, the hardware and software will be fixed and updated for government developmental and operational testing. The Joint Warfighter Assessments will provide user feedback and operational data to support programmatic and technical decisions. An In Progress Review will be held after Joint Warfighter Assessment 2020 and system testing to approve a Modification Work Order for fielding. This schedule was accelerated from the previous schedule based on the maturity of the sensor and guidance from the Chief of Staff of the Army.

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

The NTA Defense program will transition information, technologies, and capabilities associated with Pharmaceutical Based Agents (PBAs) and other emerging threats into existing and future acquisition programs utilizing a variety of contract mechanisms.

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

ROSETTA will use a streamlined approach. This approach is based on technology that will transition from Science and Technology Efforts and industry. It will be developed using the Countering Weapons of Mass Destruction (CWMD) OTA to award multiple development contracts. The M256A3 Production Contract will use Army Working Capital Funds (AWCF) to purchase the new kits. The ROSETTA funding will complete the development and testing of the new ROSETTA ticket as well as update the currently fielded M256A2 technical data package via an engineering change proposal (ECP) to create a new M256A3 kit that will be available to all Services. The M256A3 kit will replace the M256A2 kit by attrition.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
MMPRDS - HW C MERLIN System Refinement	C/CPFF	H3D INC : Ann Arbor, MI	0.000	0.793	Feb 2019	3.532	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MMPRDS - HW C - VIPER System Refinement	C/CPFF	Spectral Labs Inc. : San Diego, CA	0.000	0.750	Oct 2018	0.826	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MERLIN - HW C - Army Platform Integration Kit Development	C/CPFF	TBD : N/A	0.000	0.000		0.000		1.087	Nov 2020	-		1.087	Continuing	Continuing	0.000
AVCAD - HW S - Aerosol & Vapor Chemical Agent Detector EMD Contract	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	0.000	1.719	Jan 2019	6.901	Oct 2019	6.476	Jan 2021	-		6.476	Continuing	Continuing	0.000
AVCAD - HW S - Aerosol & Vapor Chemical Agent Detector EMD Contract #2	C/CPIF	Smiths Detection : Edgewood, MD	0.000	4.801	Jan 2019	6.901	Oct 2019	10.415	Jan 2021	-		10.415	Continuing	Continuing	0.000
AVCAD - HW C - Government SE & Technical Management Team	MIPR	Various : Various	0.000	1.657	Jan 2019	0.000		2.759	Nov 2020	-		2.759	Continuing	Continuing	0.000
AVCAD - HW C - Verification & Validation of RAM Model	MIPR	Army Materiel Systems Analysis Activity : Aberdeen Proving Ground, MD	0.000	0.065	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - HW C - Chemical Biological Radiological and Nuclear Contamination Survivability Assessment (CBRCSA) Paper Study	MIPR	West Desert Test Center : Dugway, UT	0.000	0.025	Feb 2019	0.000		0.100	Jan 2021	-		0.100	Continuing	Continuing	0.000
AVCAD - HW C - Shipping chemicals for V&V	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.002	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract - FLIR	C/CPFF	FLIR Systems : Inc., West Lafayette, IN	0.000	4.678	Jan 2019	8.442	Mar 2020	7.868	Dec 2020	-		7.868	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
MPCAD - PM/MS S - Government SE & Technical Management Team	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	1.686	Dec 2018	3.041	Jan 2020	2.014	Nov 2020	-		2.014	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract - Sig Sci	C/CPFF	Signature Science : Austin, TX	0.000	11.995	Dec 2018	5.994	Mar 2020	8.443	Dec 2020	-		8.443	Continuing	Continuing	0.000
MPCAD - HW C - OPETS Contract Support	C/FFP	Kalman & Company Inc. : Virginia Beach, VA	0.000	0.000		0.000		0.200	Feb 2021	-		0.200	Continuing	Continuing	0.000
PCAD - HW S - JCAD SLA Kit finalization	SS/CPIF	Smiths Detection : Edgewood, MD	0.000	4.492	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - HW C - PM/MS S - Government SE & Technical Management Team	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.764	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - HW C - Calibration Implementation and JCAD SLA Algorithms Expansion	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.635	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - HW C - Prototype Integration	C/FFP	TBD : N/A	0.000	0.000		0.000		0.500	Feb 2021	-		0.500	Continuing	Continuing	0.000
CSIRP - HW C - Government Matrix and Core Labor	Various	Various : Various	0.000	0.000		0.000		1.701	Mar 2021	-		1.701	Continuing	Continuing	0.000
CSIRP - HW C - OTA Funding for Prototype Plan #1	Various	TBD : N/A	0.000	0.000		0.000		2.100	Nov 2020	-		2.100	Continuing	Continuing	0.000
CSIRP - HW C - OTA Funding for Prototype Plan #2	Various	TBD : N/A	0.000	0.000		0.000		4.900	Feb 2021	-		4.900	Continuing	Continuing	0.000
EMBD - Product Development Support	MIPR	Various : Various	1.680	1.277	Nov 2018	1.152	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - OPETS contractor team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.081	0.135	Mar 2019	0.130	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - Prototype Development	SS/FFP	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	1.780	1.200	Nov 2018	1.000	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - HW - Prototype Development and Manufacturing	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	5.557	7.840	Feb 2019	3.665	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - HW SB - Prototype Development	C/CPFF	ATI Solutions : Inc., Tysons Corner, VA	0.000	3.500	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - HW - EMD Contract Award	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	28.739	2.875	Feb 2019	1.850	Nov 2019	2.360	Feb 2021	-		2.360	Continuing	Continuing	0.000
JBTDS - Product Contractor Support Team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	1.198	0.254	Feb 2019	0.280	Feb 2020	0.308	Feb 2021	-		0.308	Continuing	Continuing	0.000
JBTDS - Product Contractor Cost Support Team	C/FFP	Tecolote Research Inc : Arlington, VA	0.616	0.008	Feb 2019	0.157	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - Product Development Support - Labor, Travel, & GPC	MIPR	Various : Various	19.130	3.183	Nov 2018	4.032	Nov 2019	3.954	Nov 2020	-		3.954	Continuing	Continuing	0.000
JHBI - HW S - JHBI BIOMEME three9 Handheld Diagnostics System	C/CPFF	Advanced Technologies International : Summerville, SC	0.000	1.577	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW-Sensor Suite Development	C/CPIF	Various : Various	6.282	1.563	Mar 2019	12.075	Nov 2019	3.600	Nov 2020	-		3.600	Continuing	Continuing	0.000
JNBCRS 1 - HW C - Contractor and Product Support	SS/CPFF	Various : Various	0.000	0.000		0.000		1.322	Nov 2020	-		1.322	Continuing	Continuing	0.000
JNBCRS 1 - HW C - Platform	C/FFP	General Dynamics Land Systems : Detroit, MI	0.800	0.058	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
JNBCRS 1 - HW C - VIPER / MERLIN	C/CPFF	Advanced Technologies International : Summerville, SC	2.570	1.500	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - Government Team Labor	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	1.592	0.904	Nov 2018	2.292	Nov 2019	1.869	Nov 2020	-		1.869	Continuing	Continuing	0.000
JNBCRS 1 - HW C - CSD Contract	C/CPFF	AGENTASE : LLC, Elkridge, MD	1.978	2.096	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - CSD Contract #2	C/CPFF	L-3 Communications : Santa Rosa, CA	1.959	1.322	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - SW C Integration	C/CPFF	FLIR Systems Inc. : Elkridge, MD	0.000	7.957	Mar 2019	0.000		11.438	Nov 2020	-		11.438	Continuing	Continuing	0.000
JNBCRS 1 - HW C - CSD Contract #3	C/CPFF	Hamilton Sundstrand Corp. : Pomona, CA	1.058	0.272	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW C - Information Management/ Strategic Coordination	Various	TBD : N/A	0.000	0.000		0.000		0.176	Dec 2020	-		0.176	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Capabilities Assessments	C/CPFF	MRIGlobal : Kansas City, MO	0.301	0.000		0.300	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Capabilities Assessments #2	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.400	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Capabilities Assessment	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.047	0.095	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - System Prototype and Modification	C/CPFF	Various : Various	0.000	0.000		1.500	Dec 2019	0.495	Dec 2020	-		0.495	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Government SE &	MIPR	Edgewood Chemical Biological Center	0.097	0.200	Apr 2019	0.197	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000

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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>		
Technical Management Team		(ECBC) : Aberdeen Proving Ground, MD														
ROSETTA - HW C - Government Team Labor	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.128	Jan 2019	0.000		0.700	Nov 2020	-		0.700	Continuing	Continuing		0.000
ROSETTA - Technical Manuals	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.400	Apr 2020	0.000		-		0.000	Continuing	Continuing		0.000
ROSETTA - Technical Data Package	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.400	Apr 2020	0.000		-		0.000	Continuing	Continuing		0.000
ROSETTA - HW C-Contract Award	C/FFP	ATI Solutions : Inc., Tysons Corner, VA	0.000	1.512	Jul 2019	0.400	Jul 2020	3.418	Dec 2020	-		3.418	Continuing	Continuing		0.000
<b>Subtotal</b>			75.465	73.518		65.867		78.203		-		78.203	Continuing	Continuing		N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>		
MMPRDS - ES C - SEPM Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.387	Nov 2018	0.456	Nov 2019	0.000		-		0.000	Continuing	Continuing		0.000
MERLIN - ES S - SEPM support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.100	Nov 2020	-		0.100	Continuing	Continuing		0.000
AVCAD - Non-test OGA support	MIPR	Various : Various	0.000	0.000		4.027	Nov 2019	3.527	Jan 2021	-		3.527	Continuing	Continuing		0.000
PCAD - ES C - OGA Support PCAD - Test Planning	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.050	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing		0.000

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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
PCAD - ES C - Test Oversight Support for the JCAD SLA	MIPR	Indian Head : Indian Head, MD	0.000	0.026	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES - OTA/OGA USN Variant Support	MIPR	Various : Various	0.000	0.000		0.025	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES S - Test Planning Support	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.100	Mar 2019	0.100	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES S - Software support	MIPR	Armament Research : Development and Engineering Center, Piccatinny, NJ	0.093	0.075	Feb 2019	0.075	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES S - Test Planning Support #2	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.208	0.181	Nov 2018	0.200	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ILS S - Logistics Support	MIPR	U.S. Army Tank-automotive & Armaments Command (TACOM) : Warren, MI	0.000	0.100	Feb 2019	0.100	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES C - Navy Service Support	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.859	0.662	Oct 2018	0.606	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - ES - CBC - DPG	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.594	Jan 2019	0.750	Nov 2019	0.682	Jan 2021	-		0.682	Continuing	Continuing	0.000
JBTDS - ES - Engineering Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	2.425	0.210	Jan 2019	0.170	Nov 2019	0.197	Jan 2021	-		0.197	Continuing	Continuing	0.000

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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - Biosensor Calibration Effort	MIPR	Naval Research Lab (NRL) : Washington, DC	2.622	0.159	Jan 2019	0.150	Nov 2019	0.154	Mar 2021	-		0.154	Continuing	Continuing	0.000
JBTDS - ES - OTA/OGA Service Representation	MIPR	Various : Various	9.038	2.111	Jan 2019	2.735	Nov 2019	2.078	Jan 2021	-		2.078	Continuing	Continuing	0.000
JNBCRS 1 - ES - Engineering Support	MIPR	Various : Various	2.222	0.223	Nov 2018	2.750	Nov 2019	0.250	Nov 2020	-		0.250	Continuing	Continuing	0.000
JNBCRS 1 - ILS C	C/CPPF	Various : Various	0.000	0.000		0.000		1.638	Nov 2020	-		1.638	Continuing	Continuing	0.000
ROSETTA - ES C - Engineering and technical services for ROSETTA	MIPR	Various : Various	0.000	0.000		0.000		0.500	Nov 2020	-		0.500	Continuing	Continuing	0.000
<b>Subtotal</b>			17.467	4.878		12.144		9.126		-		9.126	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
MMPRDS - DTE -S - MERLIN DTRA Design Testing	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.223	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MMPRDS - DTE S - MERLIN Production Qualification Testing	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.000		0.760	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
MMPRDS - DTE S - VIPER - DTRA Design Testing	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.167	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MERLIN - PM Program Management	MIPR	JPM Guardian : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.107	Nov 2020	-		0.107	Continuing	Continuing	0.000
AVCAD - DTE C - Risk Reduction Chamber Testing	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.764	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
AVCAD - DTE C - T&E support	MIPR	Various : Various	0.000	0.555	Dec 2018	0.600	Nov 2020	1.395	Jan 2021	-		1.395	Continuing	Continuing	0.000
AVCAD - DTE C - Operational Assessment	MIPR	TBD : N/A	0.000	0.000		0.000		0.797	Jan 2021	-		0.797	Continuing	Continuing	0.000
AVCAD - DTE C - DT/OT Chemical Chamber, Post Field Chamber, MOT&E, Environmental (MIL-STD-810G)	MIPR	Various : Various	0.000	0.000		1.118	Feb 2020	1.030	Mar 2021	-		1.030	Continuing	Continuing	0.000
AVCAD - DTE C - DT/OT Cyber Security Vulnerability	MIPR	Armament Research : Development and Engineering Center, Piccatinny, NJ	0.000	0.000		0.400	May 2020	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - DT False (Positive) Alarm, Interoperability, Platform Integration	MIPR	Various : Various	0.000	0.000		0.790	Dec 2019	0.218	Jan 2021	-		0.218	Continuing	Continuing	0.000
AVCAD - DTE C - DT Coastal Operational Service Life	MIPR	U.S. Naval Research Lab (NRL) : Key West, FL	0.000	0.000		0.210	Apr 2020	0.100	Jan 2021	-		0.100	Continuing	Continuing	0.000
AVCAD - DTE C - DT Explosive Atmosphere Test	MIPR	Electronic Proving Ground : Fort Huachuca, AZ	0.000	0.000		0.053	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - DT Rotary Wing Compatibility Test	MIPR	Naval Air Warfare Center (Aircraft Division) : Patuxent River, MD	0.000	0.000		0.053	Jan 2020	0.028	Jan 2021	-		0.028	Continuing	Continuing	0.000
AVCAD - DTE C - DT Shipboard Operation Verification	MIPR	Potomac Test Range : Potomac Mills, VA	0.000	0.000		0.315	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - DT MIL-STD 901D - Ship Shock; MIL-STD 167-1 Vibration	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren	0.000	0.000		0.053	Feb 2020	0.025	Jan 2021	-		0.025	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		Center : Dahlgren, VA													
AVCAD - DTE C - DT Battlefield Contaminant/ Maintenance Demo	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.183	Feb 2020	0.028	Jan 2021	-		0.028	Continuing	Continuing	0.000
AVCAD - DTE C - DT Electromagnetic Survivability	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.000		0.180	Feb 2020	0.075	Mar 2021	-		0.075	Continuing	Continuing	0.000
AVCAD - DTE C - DT Fixed Wing Compatibility	MIPR	Edwards Air Force Base : Lancaster, CA	0.000	0.000		0.025	Feb 2020	0.011	Jan 2021	-		0.011	Continuing	Continuing	0.000
MPCAD - DTE C - OGA Program Support	MIPR	Various : Various	0.000	0.000		0.000		0.095	Dec 2020	-		0.095	Continuing	Continuing	0.000
MPCAD - DTE C - OGA Test Support	MIPR	Various : Various	0.000	0.326	Dec 2018	0.797	Feb 2020	0.658	Jan 2021	-		0.658	Continuing	Continuing	0.000
MPCAD - DTE C - DT Interoperability	MIPR	Eglin AFB : Eglin Air Force Base, FL	0.000	0.000		0.400	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
MPCAD - DTE C - DT Cyber Security Vulnerability	MIPR	Army Research Lab (ARL) : Adelphi, MD	0.000	0.000		0.100	Feb 2020	0.100	Feb 2021	-		0.100	Continuing	Continuing	0.000
MPCAD - DTE C - Chemical Biological Radiological Contamination Survivability (CBRCS)	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.000		0.175	Jan 2021	-		0.175	Continuing	Continuing	0.000
MPCAD - DTE C - Physical Characteristics and Signature	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.000		0.005	Dec 2020	-		0.005	Continuing	Continuing	0.000
MPCAD - DTE C - Environmental (MIL-STD-810G)	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.755	Dec 2020	-		0.755	Continuing	Continuing	0.000
MPCAD - DTE C - DT Explosive Atmosphere	MIPR	Aberdeen Test Center (ATC) :	0.000	0.000		0.050	Feb 2020	0.012	Feb 2021	-		0.012	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		Aberdeen Proving Ground, MD													
MPCAD - DTE C - DT False (Positive) Alarm, DT Logistics Demonstration	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.300	Feb 2020	0.285	Feb 2021	-		0.285	Continuing	Continuing	0.000
MPCAD - DTE C - DT Natural Desert Environmental Storage	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	0.000		0.100	Mar 2020	0.050	Jan 2021	-		0.050	Continuing	Continuing	0.000
MPCAD - DTE C - DT Electromagnetic Survivability	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.000		0.400	Jan 2020	0.711	Jan 2021	-		0.711	Continuing	Continuing	0.000
MPCAD - DTE C - DT/OT Chemical Chamber Event	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.000		3.892	Dec 2020	-		3.892	Continuing	Continuing	0.000
MPCAD - DTE C - DT/OT Post Field Chamber	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.000		0.493	Jan 2021	-		0.493	Continuing	Continuing	0.000
MPCAD - DTE C - OT Limited Users Test	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		1.800	Jun 2020	2.700	Mar 2021	-		2.700	Continuing	Continuing	0.000
MPCAD - DTE C - Contractor Development Testing	MIPR	West Desert Test Center : Dugway, UT	0.000	1.374	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPCAD - DTE C - Program Management Evaluation for Solid/Liquid Vapor Testing	MIPR	West Desert Test Center : Dugway, UT	0.000	0.736	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MPCAD - DTE - DT Library Build and System Verification	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		9.219	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE C - JCAD SLA Comparative PBA Testing in COTS/GOTS Testing	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.055	Apr 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
PCAD - DTE C - Sieve Packs for JCAD	C/CPIF	Smiths Detection : Watford Hertfordshire, UK	0.000	0.037	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE S - Agent Chamber Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.722	Jun 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE C - MIL Standard Testing Report	MIPR	West Desert Test Center : Dugway, UT	0.000	0.020	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE C - Evaluate JCAD SLA against EMI	MIPR	White Sands Missile Range (WSMR) : Mesa, AZ	0.000	0.075	Jul 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE C - Military Standard Testing	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.175	Jul 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PCAD - DTE C - Evaluate FGA Library Response	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.036	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Prototype Testing and Evaluation	Various	TBD : N/A	0.000	0.000		0.000		0.229	Feb 2021	-		0.229	Continuing	Continuing	0.000
EMBD - DTE S - DT/OT Live Agent Aerosol Testing	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		1.000	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE S - DT LOG DEMO	MIPR	Design West Technologies : Inc, Tustin, CA	0.000	0.000		0.050	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE C - DT/OT - OA/CVPA/RAM	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.000	0.030	Aug 2019	0.720	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - OTE S - Operational Test &	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren	0.000	0.000		0.750	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
Evaluation & Adversarial Assessment		Center : Dahlgren, VA													
EMBD - OTE S - DT - MIL-STD	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.250	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE - Live Agent Testing	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.323	0.520	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE - Consumable Procurement	MIPR	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.163	0.367	Jan 2019	0.600	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE - DT Testing - False Alarm	MIPR	Various : Various	0.000	0.259	Jan 2019	0.350	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - Developmental Testing	MIPR	Various : Various	5.171	1.065	Jan 2019	0.675	Nov 2019	0.771	Jan 2021	-		0.771	Continuing	Continuing	0.000
JBTDS - DTE - ARCA Chamber and Record Test Support	C/FFP	Battelle Memorial Institute : Columbus, OH	0.000	0.877	Nov 2019	0.850	Nov 2019	0.863	Jan 2021	-		0.863	Continuing	Continuing	0.000
JBTDS - DTE - V&V of JBTDS Military Utility Model	FFRDC	Institute for Defense Analysis (IDA) : Alexandria, VA	0.000	0.000		0.125	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - Operational Assessment	MIPR	Various : Various	0.000	0.592	Jan 2019	0.000		0.494	Jan 2021	-		0.494	Continuing	Continuing	0.000
JBTDS - JHU SOLITUDE	C/FFP	Johns Hopkins University - Applied Physics Lab : Laurel, MD	2.642	0.990	May 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JHBI - DTE S - Test and Evaluation Support	MIPR	Johns Hopkins University - Applied	0.203	0.055	Jul 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>				
		Physics Lab : Laurel, MD														
JNBCRS 1 - DTE - Test and Evaluation	MIPR	Various : Various	1.174	2.849	Nov 2018	7.470	Nov 2019	2.000	Nov 2020	-		2.000	Continuing	Continuing	0.000	
NTA DEFENSE - DTE C - Field-forward PBA Detection	Various	TBD : N/A	0.000	0.000		0.000		1.416	Nov 2020	-		1.416	Continuing	Continuing	0.000	
NTA DEFENSE - DTE C - System Prototype Development	Various	TBD : N/A	0.000	0.000		0.000		1.000	Apr 2021	-		1.000	Continuing	Continuing	0.000	
NTA DEFENSE - DTE S - Capability Assessments	MIPR	Various : Various	0.602	0.759	Dec 2018	0.700	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000	
ROSETTA - DTE C - Development Testing	MIPR	Various : Various	0.000	0.000		2.300	Oct 2019	1.100	Nov 2020	-		1.100	Continuing	Continuing	0.000	
<b>Subtotal</b>			10.278	13.628		33.746		21.618		-		21.618	Continuing	Continuing	N/A	

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
MMPRDS - Program Management Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.423	Nov 2018	0.457	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - PM/MS C - Management Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	1.239	Jan 2019	0.000		4.063	Jan 2021	-		4.063	Continuing	Continuing	0.000
MPCAD - PM/MS S - JPEO CBRN and JPM	MIPR	JPM NBC Contamination	0.000	2.119	Nov 2018	5.189	Dec 2019	5.501	Dec 2020	-		5.501	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
NBC CA Management Support		Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD													
PCAD - PM/MS S - JPEO CBRN and JPM NBC CA Management Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	1.209	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Project Management	Various	TBD : N/A	0.000	0.000		0.000		1.821	Jan 2021	-		1.821	Continuing	Continuing	0.000
EMBD - JPEO Program Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.878	1.329	Feb 2019	1.659	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - JPM CA Program Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	2.600	0.500	Oct 2018	0.735	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
GBTI - PM/MS C - Program Management Support	Allot	JPM Guardian : Aberdeen Proving Ground, MD	1.855	1.100	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - JPEO Program Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	14.217	0.756	Nov 2018	1.808	Nov 2019	1.282	Nov 2020	-		1.282	Continuing	Continuing	0.000
JBTDS - JPM CA Program Support & Core Labor	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	3.326	0.715	Jan 2019	0.770	Jan 2020	0.919	Jan 2021	-		0.919	Continuing	Continuing	0.000



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
MMPRDS - MERLIN (Standoff Detection) RFP	█																											
MMPRDS - MERLIN (Standoff Detection) Production Ready Test Assets	█	█	█	█	█	█	█	█																				
MMPRDS - Testing MERLIN (Standoff Detection)		█	█	█	█	█	█																					
MMPRDS - MERLIN (Standoff Detection) FRP							█	█																				
MMPRDS - VIPER (Point Detection) Production Ready Test Assets	█	█	█	█	█	█	█																					
MMPRDS - VIPER (Point Detection) Testing		█	█	█	█	█	█																					
MMPRDS - VIPER (Point Detection)							█	█																				
MERLIN - Army Platform Integration OTA												█																
MERLIN - Army Platform Full Materiel Release																												
MERLIN - Army Platform Integration																												
MERLIN - MERLIN (Standoff Detection) FRP																												
MERLIN - Army Platform Integration Milestone C																												
AVCAD - EMD Contract (NGCD 1)	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
AVCAD - MS C																												
AVCAD - LRIP																												
AVCAD - FRP Decision																												
AVCAD - IOC																												
MPCAD - EMD Contract	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	
MPCAD - MS C																												
MPCAD - LRIP																												
MPCAD - FRP																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CSIRP - OTA Request For Information	■																											
CSIRP - Materiel Development Decision			■																									
CSIRP - Request for White Papers - Prototyping Plan #1		■																										
CSIRP - OTA Award for Prototyping Plan #1				■																								
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #1																												
CSIRP - Demonstration and Transition Decision - Prototyping Plan #1																												
CSIRP - Request for White Papers - Prototyping Plan #2																												
CSIRP - OTA Award for Prototyping Plan #2																												
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #2																												
CSIRP - Demonstration and Transition Decision - Prototyping Plan #2																												
CSIRP - Prototyping Plan #3																												
EMBD - Joint Requirements Oversight Council Memorandum (JROCM)																												
EMBD - Test and Evaluation Master Plan																												
EMBD - Production Quality Test (PQT)																												
EMBD - Operational Assessment																												
EMBD - MS C																												
EMBD - LRIP Contract Award																												
EMBD - OT&E																												
EMBD - FRP Decision																												
EMBD - FRP Production																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
GBTI - Evaluate Transition Options	█																											
JBTDS - Developmental Testing				█	█	█	█																					
JBTDS - PQT							█	█	█	█																		
JBTDS - Milestone C												█	█															
JBTDS - LRIP Contract Award														█														
JBTDS - LRIP Production														█	█	█	█											
JBTDS - PVT																	█	█										
JBTDS - MOT&E																	█	█										
JBTDS - FRP Decision																										█		
JBTDS - FRP Award																										█		
JBTDS - IOC																											█	
JHBI - three9 System MS C																											█	
JHBI - Developmental Testing - Integrated Sample Prep		█	█	█	█																							
JNBCRS 1 - NBCRV Sensor Suite Development	█	█																										
JNBCRS 1 - Joint Warfighter Assessment 2019			█																									
JNBCRS 1 - Design and Fabrication Phase 2		█	█	█	█	█	█																					
JNBCRS 1 - Component Test												█	█	█	█													
JNBCRS 1 - System Level Test 1												█	█	█	█													
JNBCRS 1 - Joint Warfighter Assessment 2020																											█	
JNBCRS 1 - Modification Work Order Executing IPR																											█	
JNBCRS 1 - Production / Fielding																											█	
NTA DEFENSE - Capabilities Assessment	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 - Strategic Coordination/ Information Management																												
NTA DEFENSE - Systems Prototyping and Development																												
NTA DEFENSE - Field Forward PBA-Detection																												
ROSETTA - OTA Contract																												
ROSETTA - Testing & Demonstrations																												
ROSETTA - Update TDP and TMs																												
ROSETTA - Approve Engineering Change Proposals																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MMPRDS - MERLIN (Standoff Detection) RFP	1	2019	1	2019
MMPRDS - MERLIN (Standoff Detection) Production Ready Test Assets	1	2019	2	2020
MMPRDS - Testing MERLIN (Standoff Detection)	2	2019	2	2020
MMPRDS - MERLIN (Standoff Detection) FRP	3	2020	4	2020
MMPRDS - VIPER (Point Detection) Production Ready Test Assets	1	2019	1	2020
MMPRDS - VIPER (Point Detection) Testing	2	2019	2	2020
MMPRDS - VIPER (Point Detection)	3	2020	4	2020
MERLIN - Army Platform Integration OTA	1	2021	1	2021
MERLIN - Army Platform Full Materiel Release	4	2022	4	2022
MERLIN - Army Platform Integration	1	2021	4	2022
MERLIN - MERLIN (Standoff Detection) FRP	1	2023	3	2025
MERLIN - Army Platform Integration Milestone C	1	2022	1	2022
AVCAD - EMD Contract (NGCD 1)	1	2019	4	2021
AVCAD - MS C	4	2021	4	2021
AVCAD - LRIP	4	2021	2	2023
AVCAD - FRP Decision	2	2023	2	2023
AVCAD - IOC	2	2024	4	2024
MPCAD - EMD Contract	1	2019	3	2022
MPCAD - MS C	3	2022	3	2022
MPCAD - LRIP	3	2022	1	2025
MPCAD - FRP	2	2025	4	2025
CSIRP - OTA Request For Information	1	2019	1	2019

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
CSIRP - Materiel Development Decision	3	2019	3	2019
CSIRP - Request for White Papers - Prototyping Plan #1	2	2019	2	2019
CSIRP - OTA Award for Prototyping Plan #1	4	2019	4	2019
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #1	2	2020	4	2021
CSIRP - Demonstration and Transition Decision - Prototyping Plan #1	4	2021	4	2021
CSIRP - Request for White Papers - Prototyping Plan #2	2	2020	2	2020
CSIRP - OTA Award for Prototyping Plan #2	2	2021	2	2021
CSIRP - Test and Evaluation of Prototypes - Prototyping Plan #2	3	2021	4	2022
CSIRP - Demonstration and Transition Decision - Prototyping Plan #2	1	2023	1	2023
CSIRP - Prototyping Plan #3	4	2022	4	2024
EMBD - Joint Requirements Oversight Council Memorandum (JROCM)	4	2019	4	2019
EMBD - Test and Evaluation Master Plan	4	2019	4	2019
EMBD - Production Quality Test (PQT)	4	2019	3	2020
EMBD - Operational Assessment	2	2020	2	2020
EMBD - MS C	3	2020	3	2020
EMBD - LRIP Contract Award	3	2020	3	2020
EMBD - OT&E	3	2020	4	2020
EMBD - FRP Decision	2	2021	2	2021
EMBD - FRP Production	2	2021	4	2025
GBTI - Evaluate Transition Options	1	2019	2	2019
JBTDS - Developmental Testing	4	2019	4	2020
JBTDS - PQT	4	2020	4	2021
JBTDS - Milestone C	1	2022	2	2022
JBTDS - LRIP Contract Award	3	2022	3	2022
JBTDS - LRIP Production	3	2022	3	2023

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
JBTDS - PVT	1	2023	3	2023
JBTDS - MOT&E	1	2023	2	2023
JBTDS - FRP Decision	2	2024	2	2024
JBTDS - FRP Award	2	2024	2	2024
JBTDS - IOC	3	2023	3	2023
JHBI - three9 System MS C	3	2020	3	2020
JHBI - Developmental Testing - Integrated Sample Prep	2	2019	3	2020
JNBCRS 1 - NBCRV Sensor Suite Development	1	2019	3	2019
JNBCRS 1 - Joint Warfighter Assessment 2019	3	2019	3	2019
JNBCRS 1 - Design and Fabrication Phase 2	2	2019	3	2021
JNBCRS 1 - Component Test	3	2021	3	2022
JNBCRS 1 - System Level Test 1	3	2021	3	2022
JNBCRS 1 - Joint Warfighter Assessment 2020	3	2020	3	2020
JNBCRS 1 - Modification Work Order Executing IPR	2	2022	2	2022
JNBCRS 1 - Production / Fielding	3	2022	4	2024
NTA DEFENSE - Capabilities Assessment	1	2019	4	2025
NTA DEFENSE - Strategic Coordination/Information Management	1	2019	4	2025
NTA DEFENSE - Systems Prototyping and Development	1	2019	4	2025
NTA DEFENSE - Field Forward PBA-Detection	4	2019	4	2021
ROSETTA - OTA Contract	4	2019	4	2019
ROSETTA - Testing & Demonstrations	4	2019	1	2022
ROSETTA - Update TDP and TMs	1	2020	4	2022
ROSETTA - Approve Engineering Change Proposals	2	2022	2	2022

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
CM5: <i>Homeland Defense (SDD)</i>	-	4.775	10.146	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.921
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project supports Engineering and Manufacturing Development of common analytical laboratory system capabilities to conduct on-site analysis of any unknown sample and test potential life-threatening substances.

The effort included in this project is:

- (1) Common Analytical Laboratory System capability (CALs)

The CALs will provide common analytical capabilities packaged to meet the specific CONOPS and mission of the gaining unit to 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, the Army 20th Support Command, the Army Medical Laboratory, the Air Force, and the Navy. There will be two variants of CALs, the Theater Validation Integrated System (TV-IS) and the Field Confirmatory Analytical Capability Sets (FC-ACS). TV-IS is currently in the EMD phase, with proto-types built and EMD testing that began in February 2019 and concludes in 2QFY2020.

Theater Validation Integrated System (TV-IS) Variant - Army User - A lab with a high level of confidence in analytical results through the use of orthogonal (complimentary) technologies and an expanded analytical suite that employs multiple standardized ISO containers, which will be integrated onto one Family of Medium Tactical Vehicles (FMTV) and two trailers. TV-IS is currently in the EMD phase, with EMD testing that concludes in early FY2020. The TV-IS Milestone C decision is currently scheduled for Mid FY2020 to enter into the Production & Deployment Phase.

Field Confirmatory Analytical Capability Sets (FC-ACS) Variant - Army, Navy, Air Force and NGB User - A transportable equipment subset that allows them to be loaded into transport cases and palletized if required. FC-ACS is post Milestone C and is not a RDTE funded part of CALs, it is in the production phase.

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) CALs	4.775	10.146	-
<b>Description:</b> Theater Validation Integrated System (TV-IS) Variant - Army User - A lab with a high level of confidence in analytical results through the use of orthogonal (complimentary) technologies and an expanded analytical suite that employs multiple standardized ISO containers, which will be integrated onto one Family of Medium Tactical Vehicles (FMTV) and two trailers.			
<b>FY 2020 Plans:</b>			

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Complete Operational Test and Logistics Demonstration for the theater validation variant. Develop Next Generation Diagnostic System (NGDS) food and water assay panel associated with Bio Detection capability to include sample processing protocols.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase.			
<b>Accomplishments/Planned Programs Subtotals</b>	4.775	10.146	-

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

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• JS0005: COMMON ANALYTICAL LABORATORY SYSTEM (CALs)	48.317	4.293	37.173	-	37.173	27.370	33.556	34.930	28.769	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
COMMON ANALYTICAL LABORATORY SYSTEM (CALs)

The Common Analytical Laboratory System (CALs) will be developed leveraging both Commercial Off the Shelf (COTS) and Government Off the Shelf (GOTS) analytical components to support the identification of Chemical, Biological, Radiological and Nuclear (CBRN) agent materials in environmental samples. CALs will consist of (2) 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. A theatre validation variant will be designed and built for a longer duration mission and for semi-permanent applications. An analytical capability suite variant will be designed for shorter duration field confirmatory missions. JPdM CBRNE A&RS awarded one contract during the EMD Phase. The contract was awarded to Battelle Memorial Institute (BMI) (prime) to develop, deliver, manage, and maintain a CALs Technical Data Package (TDP) throughout the EMD Phase. The TDP to be delivered to the Government at the end of the EMD Phase is to include all product data required by the Production Level specifications outlined in Military Standard (MIL-STD)-31000A, and will reflect the tested baseline configuration incorporating all approved changes. As part of the common acquisition strategy, CALs is incorporating the NGDS platform to meet this threshold requirement; specifically to identify various bacterial and viral agents in the CALs integrated systems. This platform provides the ability to analyze for bacterial and viral agents in various environmental, food, and water matrices (sample types).

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Prototype System Manufacturing	C/CPIF	Battelle Memorial Institute : Columbus, OH	33.551	2.168	Nov 2018	0.000		0.000		-		0.000	0.000	35.719	0.000
CALS - HW S - NGDS Tactical Variant Alpha Prototype	SS/CPFF	BioFire Dx : Salt Lake City, UT	1.855	0.000		1.396	Nov 2019	0.000		-		0.000	0.000	3.251	0.000
<b>Subtotal</b>			35.406	2.168		1.396		0.000		-		0.000	0.000	38.970	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - Engineering Support System	C/FFP	Various : Various	13.229	0.000		1.221	Feb 2020	0.000		-		0.000	0.000	14.450	0.000
CALS - ES C - Other Government Agencies Services	MIPR	Various : Various	0.946	0.237	Jan 2019	0.902	Jan 2020	0.000		-		0.000	0.000	2.085	0.000
CALS - TD/D S - Safety Internal Review Board	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.282	0.100	Mar 2019	0.100	Mar 2020	0.000		-		0.000	0.000	0.482	0.000
<b>Subtotal</b>			14.457	0.337		2.223		0.000		-		0.000	0.000	17.017	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - OTH T C - Operation Test Agency	MIPR	Operational Test Command (OTC) : Ft. Hood, TX	0.000	0.000		1.808	Apr 2020	0.000		-		0.000	0.000	1.808	0.000
CALS - DTE C - Other Government Agencies	MIPR	Various : Various	0.000	0.000		2.361	Apr 2020	0.000		-		0.000	0.000	2.361	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 Testing (DT) (TV IS)	██████████																											
CALS - Functional Configuration Audit (TV IS)							████																					
CALS - Milestone C (TV IS) Decision							████																					
CALS - Production Verification Test (TV IS)								██████████																				
CALS - Operational Test (TV IS)												██████████																
CALS - Logistics Demonstration (TV IS)								████																				

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CALS - Developmental Testing (DT) (TV IS)	2	2019	1	2020
CALS - Functional Configuration Audit (TV IS)	2	2020	2	2020
CALS - Milestone C (TV IS) Decision	2	2020	2	2020
CALS - Production Verification Test (TV IS)	3	2020	4	2020
CALS - Operational Test (TV IS)	4	2020	2	2021
CALS - Logistics Demonstration (TV IS)	4	2020	4	2020

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (SDD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CO5: <i>Collective Protection (SDD)</i>	-	8.781	7.272	7.885	-	7.885	2.983	0.000	0.000	0.000	0.000	26.921
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project supports Engineering and Manufacturing Development and Low Rate Initial Production 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. This allows for a more resilient force posture, sustaining Joint Force military advantages and building a more lethal Force, efforts that align with the National Defense Strategy.

The systems included in this project are:

- (1) Chemical Biological Aircraft Survivability Barrier (CASB)
- (2) Joint Expeditionary Collective Protection (JECF) Family of Systems

The CASB will provide a lightweight, low-cost, expendable, negative-pressure enclosure that will protect the interior of DoD multi-service aircraft assets (MH-47, CV22, MC-130) capable of airlifting/exfiltrating chemically or biologically contaminated personnel, equipment, and cargos while preserving the aircraft for continued unrestricted operations without the need for extensive decontamination. CASB will field a capability that supports the overall intent of the Aircraft chemical, biological, radiological and nuclear (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 from incidental cross-contamination by chemical and biological (CB)-contaminated personnel and equipment and cargos under transport.

JECF provides the Joint Expeditionary Forces a collective protection capability that is lightweight, compact, modular, and affordable. JECF is a family of systems, developed in two phases, that will allow the application of collective protection to transportable soft-side shelters, enclosed spaces of opportunity, and in remote austere locations as a standalone resource. Phase 1 includes standalone collective protection systems and kits that provide existing host platforms and structures with CBRN protection. Phase 2 includes kits that provide CBRN protection to 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 will reduce the need for personnel and equipment decontamination and is a strategic deterrence against state adversaries and non-state actors from using weapons of mass destruction, a National Defense Strategy objective.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Chemical and Biological Aircraft Survivability Barrier (CASB)	2.809	0.877	-
<b>Description:</b> CASB prototype development and testing through the EMD Phase.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Complete testing and prepare all required documentation in support of MS C.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase.</p>			
<p><b>Title:</b> 2) JECP</p> <p><b>Description:</b> Phase 2 system Development and Demonstration Events</p> <p><b>FY 2020 Plans:</b> Continue updates/development of logistics products. Conduct Logistics Demonstration, provisioning conference and begin logistics assessment. Complete Phase 2 test article manufacturing for Government developmental and operational testing (OT). (Qty 4 - Tent Kit Single Skin, Qty 3 - Tent Kit 1, Qty 1 - Tent Kit 3, Qty 4 - Structure Kit Unimproved). Continue Government DT and begin detailed planning for Multi Operational Test and Evaluation (MOT&amp;E) event and Technical Manual verification. Conduct physical configuration audit, manufacturing readiness and production readiness assessments.</p> <p><b>FY 2021 Plans:</b> Complete DT testing and reporting. Complete LRIP manufacturing for OT (Qty 2 - Tent Kit Single Skin, Qty 3 - Tent Kit 1, Qty 1 - Tent Kit 3, Qty 1 - Structure Kit Unimproved). Conduct MOT&amp;E, Logistics Demonstration and TM verification events. Finalize technical data, logistics products and update/draft program acquisition documentation.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project schedule. Increase is due to program plans. Program will be completing DT and conducting OT in FY21.</p>	5.972	6.395	7.885
<b>Accomplishments/Planned Programs Subtotals</b>	8.781	7.272	7.885

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• JP1111: JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)	24.552	13.570	14.496	-	14.496	24.135	32.490	39.038	25.193	Continuing	Continuing

**Remarks**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

**D. Acquisition Strategy**

CHEMICAL BIOLOGICAL AIRCRAFT SURVIVABILITY BARRIER (CASB)

The Chemical Biological Aircraft Survivability Barrier (CASB) overall strategy is to utilize primary materials (air filtration and flexible barrier material) currently in use by other programs in the CB defense portfolio. CASB reviewed existing materials and technology as well as designs, configurations, and test data from legacy systems developed for ColPro applications. Using this information, systems are being 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 initiated at MS B EMD phase to meet these expanded requirements within the various airframes. CASB is leveraging an IDIQ contract to pursue a Commercial-of-the-Shelf (COTS) development strategy using full and open competition for awards following MS C. During the EMD phase, CASB awarded a Cost Plus Incentive Fee (CPIF) delivery order for the development and delivery of prototypes for airworthiness certification within two years.

JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)

JECP Family of Systems (FoS) (Phase 1 and Phase 2) involves multiple contract types throughout the Engineering and Manufacturing Development (EMD) and Production and Deployment Phases of the program. Having achieved a Full Rate Production (FRP) decision for Phase 1 Systems in December 2016, the program exercised Fixed Price Incentive (FPI) production options in FY17 & FY18 through the now expired contract with Leidos in support of Initial Operational Capability (IOC). A competitive build-to print follow-on production delivery order contract was awarded June 2019 to Production Products Manufacturing and will support the remaining production of Phase 1 Systems to meet Full Operational Capability (FOC). Phase 2 systems will be developed as engineering changes to the Phase 1 systems under a separate competitive delivery order awarded March 2019 to Leidos and undergo limited developmental and operational testing in pursuit of a FRP decision. Production options are included in the delivery order to meet FOC for Phase 2 systems. Additionally, BA7 funding will develop incremental improvements to fielded JECP FoS. BA7 efforts include a range of improvements intended to enhance filtration protection, provide a field leakage test capability and update various fielded Environmental Control Unit (ECU) interface types for use with collective protection. These efforts involve development of designs and prototyping under the Other Transaction Authority (OTA) through the Countering Weapons Mass Destruction (CWMD) Consortium contract as well as exploitation of commercial off-the-shelf items.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CASB - HW S - Prototype Development, TRA, MRA	C/FFP	Integrated Solutions for Systems (IS4S) : Huntsville, AL	1.279	0.352	Feb 2019	0.000		0.000		-		0.000	0.000	1.631	0.000
JECP - HW S - Phase 2 System Product Development/Phase 2 Prototype Manufacturing	C/FPIF	Leidos : Abingdon, MD	0.845	2.506	Mar 2019	2.590	Jan 2020	3.200	Dec 2020	-		3.200	0.000	9.141	0.000
<b>Subtotal</b>			2.124	2.858		2.590		3.200		-		3.200	0.000	10.772	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CASB - ES S - IPT and Technical Support	MIPR	Various : Various	0.584	0.781	Nov 2018	0.252	Jan 2020	0.000		-		0.000	0.000	1.617	0.000
JECP - ES S/ILS S - Engineering, Logistics, Technical, IPT Support	MIPR	Various : Various	2.036	0.850	Nov 2018	1.188	Nov 2019	1.779	Dec 2020	-		1.779	0.000	5.853	0.000
<b>Subtotal</b>			2.620	1.631		1.440		1.779		-		1.779	0.000	7.470	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CASB - OTE S - Operational Testing	MIPR	Various : Various	0.000	0.315	Jan 2019	0.520	Apr 2020	0.000		-		0.000	0.000	0.835	0.000
CASB - DTE S - Developmental Testing	MIPR	Various : Various	0.552	0.738	Nov 2018	0.000		0.000		-		0.000	0.000	1.290	0.000
JECP - OTHS SB - Test & Evaluation IPT/OTE S - Operational Testing/DTE S	MIPR	Various : Various	7.839	1.627	Nov 2018	1.309	Nov 2019	1.249	Dec 2020	-		1.249	0.000	12.024	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
- Phase 2 Developmental testing															
<b>Subtotal</b>			8.391	2.680		1.829		1.249		-		1.249	0.000	14.149	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CASB - PM/MS S - Program Management Support	MIPR	Various : Various	0.335	0.623	Nov 2018	0.105	Nov 2019	0.000		-		0.000	0.000	1.063	0.000
JECP - PM/MS S - Program Management Support	MIPR	Various : Various	11.820	0.989	Nov 2018	1.308	Nov 2019	1.657	Dec 2020	-		1.657	0.000	15.774	0.000
<b>Subtotal</b>			12.155	1.612		1.413		1.657		-		1.657	0.000	16.837	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	25.290	8.781	7.272	7.885	-	7.885	0.000	49.228	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CASB - Developmental Test and Evaluation	██████████																											
CASB - Capabilities Production Document	██																											
CASB - Operational Test					██████████																							
CASB - Milestone C					██																							
CASB - Production and Deployment					██																							
CASB - IOC									██																			
CASB - FOC													██															
JECP - Acquisition Decision Memorandum			██																									
JECP - Phase 2 Engineering Changes Development	██		██████████																									
JECP - Phase 2 Development Testing (DT)			████████████████████																									
JECP - Phase 2 Operational Testing (OT)								██████████																				
JECP - Phase 2 Full Rate Production Decision (FRP)												██																
JECP - Initial Operational Capability (IOC)																██												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CASB - Developmental Test and Evaluation	1	2019	1	2020
CASB - Capabilities Production Document	1	2019	1	2019
CASB - Operational Test	4	2019	2	2020
CASB - Milestone C	2	2020	2	2020
CASB - Production and Deployment	2	2020	3	2022
CASB - IOC	1	2021	1	2021
CASB - FOC	3	2022	3	2022
JECP - Acquisition Decision Memorandum	3	2019	3	2019
JECP - Phase 2 Engineering Changes Development	2	2019	4	2019
JECP - Phase 2 Development Testing (DT)	4	2019	2	2021
JECP - Phase 2 Operational Testing (OT)	3	2021	4	2021
JECP - Phase 2 Full Rate Production Decision (FRP)	2	2022	2	2022
JECP - Initial Operational Capability (IOC)	4	2022	4	2022

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DE5: Decontamination (SDD)	-	15.399	7.989	16.954	-	16.954	9.729	5.074	9.793	9.317	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 remove and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment, helping sustain a resilient force posture, one of the efforts outlined in the National Defense Strategy. 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, Concept of Operations and Tactics, Techniques & Procedures.

Efforts included in this Project are:

- (1) Contaminated Human Remains System (CHRS)
- (2) Decontamination Family of Systems (DFoS) Contamination Indicator Decontamination Assurance System (CIDAS)
- (3) DFoS CIDAS Blister
- (4) Forward Area Mobility Spray - System (FAMS-S)
- (5) Major Defense Acquisition Program (MDAP)
- (6) Mass Personnel Decontamination (MPD)
- (7) Joint Biological Agent Decontamination System (JBADS)

The CHRS program will provide a Contaminated Human Remains Transfer Case (CHRT) packaging solution to safely return chemical, biological, or radiological contaminated human remains to the Continental United States. The CHRT is a containment system that 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 program addresses capability gaps identified within both the ConMit Initial Capabilities Document (ICD), dated March 2011, and the Mortuary Affairs ICD, dated October 2008.

Decontamination Family of Systems (DFoS) Contamination Indicator Decontamination Assurance System (CIDAS) is a contamination indicator and decontamination assurance technology. 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. DFoS 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. This helps sustain a resilient force posture, making the Joint Force more adaptable against the uncertainty in a changing global strategic environment, an effort listed in the National Defense Strategy under building a more lethal force. It will consist of an indicator and an applicator, with three applicator configurations -- small-scale, tactical large scale, and reusable large scale applicators -- and three indicator formulations -- nerve training, nerve and blister indicators.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

Starting in FY21, the DFoS CIDAS program is being broken into separate CIDAS Nerve and CIDAS Blister programs as the capabilities are intended to fulfill distinct solutions to meet Warfighter needs. The CIDAS Nerve program will address the visual disclosure of traditional and non-traditional nerve agents while the CIDAS Blister program addresses traditional blister agents, two separate threat scenarios that require different materiel solutions, modernizing a key capability to help build a more lethal force, as outlined in the National Defense Strategy.

DFoS CIDAS Blister is a contamination indicator and decontamination assurance technology. It will consist of a blister indicator and an applicator. The indicator will be sprayed on tactical vehicles, aircraft, ships, crew-served weapons, and individual weapons that may have been exposed to blister agent chemical contamination. DFoS CIDAS Blister is a new capability for the Joint Forces that will reduce the logistics burden of decontamination by indicating presence and location of blister chemical agent on militarily relevant surfaces pre- and post-decontamination.

The FAMS-S program is a new start program in FY21 and transitioning an improved sprayable decontaminate prototype technology being developed under the NTA Defense budget to a dedicated budget line in FY21. FAMS-S will provide Special Operations Forces (SOF) and SOF Task Forces (SOTFs) a man-portable and mobile platform capable of rapidly decontaminating chemical and biological (CB) agents from the exterior of aircraft, helicopters, boats, vehicles, or support equipment to a level that is clean enough for re-use without having to wear CB protective equipment in order to quickly re-equip the force -- maximizing tactical flexibility and fighting strength while minimizing the logistical burden and the cost of conducting Countering Weapons of Mass Destruction (CWMD) and CB operations. FAMS-S system variants envisioned are Large, Small, and Man-Portable configurations that will provide sufficient form factor to enable the SOF tactical forces to push decontamination capability as "far forward as possible" to execute decontamination "as soon as possible" following the tenants of decontamination.

The MDAP Chemical Biological Radiological and Nuclear (CBRN) Survivability Initiative ensures weapon system programs at all Acquisition Category (ACAT) levels, as well as non-DoD agency programs such as those programs at the Department of Homeland Security (DHS), meet their CBRN defense requirements. This effort facilitates and coordinates the research, development, test and evaluation, procurement, delivery, and life cycle sustainment of affordable CBRN defense materiel solutions for each program's documented CBRN requirements.

The Mass Personnel Decontamination (MPD) program will develop an array of rugged and reliable best-of-breed hardware in a manageably sized, easy-to-erect, modular system that can be quickly tailored to different mass casualty events in order to support decontamination of ambulatory and non-ambulatory patients, and allow for the processing of contaminated human remains. The program addresses capability gaps identified within the Consequence Management ICD dated 14 October 2010, the ConMit ICD dated 1 March 2011, and the Mortuary Affairs Operations ICD dated October 2008, modernizing a key capability under the National Defense Strategy's line of effort of building a more lethal force.

The Joint Biological Agent Decontamination System (JBADS) will provide the capability to conduct biological agent decontamination of the interior and exterior of the C-130 aircraft. The JBADS is a capability set that will include a shelter to encapsulate an airframe, a decontamination delivery system (e.g., hot-humid air-blower), 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 aircraft to safe levels and allow more rapid return to service, rebuilding military readiness and building a more lethal Joint Force as outlined in the National Defense Strategy. Future capability may address biological decontamination of vehicles and additional aircraft.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) Contaminated Human Remains System (CHRS)</p> <p><b>Description:</b> Contaminated Human Remains Transfer Case (CHRT) Development and Support</p> <p><b>FY 2020 Plans:</b> Complete Operational Test Agency Evaluation Report (OER), and Technology and Manufacturing Readiness Assessments in support of Full Rate Production (FRP). Update Technical Manuals, if required based on Operational Testing (OT) results. Update Life Cycle Sustainment Plan and other documentation in preparation for Milestone C/Full Rate Production decision. Complete Physical Configuration Audit.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase.</p>	-	2.118	-
<p><b>Title:</b> 2) Decon Family of Sys (DFoS) Contam Indicator Decon Assurance Sys (CIDAS)</p> <p><b>Description:</b> Small Scale Applicators (SSA) - Nerve Indicator Kit</p>	0.260	-	-
<p><b>Title:</b> 3) DFoS CIDAS</p> <p><b>Description:</b> Small Scale Applicators (SSA) - Blister Indicator Kit</p> <p><b>FY 2020 Plans:</b> Conduct Sustainment Cost Reduction efforts with prime contractor to reduce the sustainment unit cost of the blister indicator by qualifying alternate sources of raw materials and changing manufacturing processes to increase efficiencies. Procure 62 Small Scale Applicator - Blister indicator kits for Developmental Testing (DT) and associated Contract Data Requirements Lists (CDRLs) for Contractor's Progress, Status and Management Report, Program Schedule, etc. Conduct DT to include level of indication (LOI) testing, material and detector compatibility.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (DFoS CIDAS Blister)</p>	0.419	4.248	-
<p><b>Title:</b> 4) DFoS CIDAS</p> <p><b>Description:</b> Large Scale Applicators (LSA) (Nerve and Blister kits)</p> <p><b>FY 2020 Plans:</b> Procure 50 LSAs- Blister Indicator kits for Developmental Testing (DT) and associated Contract Data Requirements Lists (CDRLs). Conduct DT and prepare for LSA production decision and fielding.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	3.367	0.378	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. (DFoS CIDAS Blister)				
<p><b>Title:</b> 5) DFoS CIDAS BLISTER</p> <p><b>Description:</b> Blister Indicator Kits and Large Scale Applicators</p> <p><b>FY 2021 Plans:</b> Award option on Blister contract to procure 1,500 Small Scale Applicator (SSA) Blister Kits, 250 Large Scale Applicator (LSA) Blister Kits, and associated Contract Data Requirements Lists (CDRLs) to initiate and complete Product Qualification Testing (PQT) (i.e. area of coverage, environmental factors, logistics demonstration), Developmental Testing (DT), and Operational Testing (OT) in support of Full Rate Production (FRP).</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (DFoS CIDAS)</p>		-	-	5.467
<p><b>Title:</b> 6) Forward Area Mobility Spray - System</p> <p><b>Description:</b> Prototype Development</p> <p><b>FY 2021 Plans:</b> Award system development contract to begin prototype build, and initiate early developmental and operational test planning for integration suitability and interoperability effectiveness.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project is new start effort in FY 2021. FAMS-S will utilize efforts conducted under NTA DEFENSE budget, RDT&amp;E Project Contamination Avoidance (CA), for an improved sprayable decontamination slurry, containment system, and delivery mechanism.</p>		-	-	1.828
<p><b>Title:</b> 7) Major Defense Acquisition Program (MDAP)</p> <p><b>Description:</b> CBRN Survivability support</p> <p><b>FY 2020 Plans:</b> Continue to ensure CBRN survivability requirements are met for MDAP's by cross-walking requirements documents with program execution plans. Attend meetings to address integration needs and present CBRN system and hardware options. Provide subject matter expertise in the execution of CBRN survivability requirements for both materiel and non-material solutions. Review and assist in document preparation for milestones and programs reviews. Conduct CBRN survivability compliance reviews for Optionally Manned Fighting Vehicle, Robotic Combat Vehicle, Future Long Range Assault Aircraft, Future Attack Reconnaissance</p>		0.435	1.023	1.035

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Aircraft, Littoral Combat Ship, European Reassurance Initiative, and other CBRN survivability system integration in preparation for various program acquisition milestones, system and subsystem test events, design reviews and low rate initial production reviews.</p> <p><b>FY 2021 Plans:</b> Continue to ensure CBRN survivability requirements are met for MDAP's by cross-walking requirements documents with program execution plans. Attend meetings to address integration needs and present CBRN system and hardware options. Provide subject matter expertise in the execution of CBRN survivability requirements for both materiel and non-material solutions. Review and assist in document preparation for milestones and programs reviews. Conduct CBRN survivability compliance reviews for Optionally Manned Fighting Vehicle, Robotic Combat Vehicle, Future Long Range Assault Aircraft, Future Attack Reconnaissance Aircraft, Synthetic Training Environment, Precision Navigation and Timing, multiple Soldier Lethality programs, and other CBRN survivability system integration in preparation for various program acquisition milestones, system and subsystem test events, design reviews and low rate initial production reviews.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 8) Mass Personnel Decontamination (MPD)</p> <p><b>Description:</b> Engineering and Manufacturing Development (EMD) activities and Product Development</p> <p><b>FY 2021 Plans:</b> Award contract for DT systems and conduct DT.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Engineering and Manufacturing Development Phase.</p>	-	-	3.825
<p><b>Title:</b> 9) Joint Biological Agent Decontamination System (JBADS)</p> <p><b>Description:</b> Development and Testing</p> <p><b>FY 2020 Plans:</b> Complete Contractor Specification Testing. Continue Future Capabilities Analysis.</p> <p><b>FY 2021 Plans:</b> Initiate/Complete Initial Operational Test and Evaluation (IOT&amp;E). Complete Future Capabilities Analysis.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. (IOT&amp;E being conducted)</p>	10.918	0.222	4.799
<b>Accomplishments/Planned Programs Subtotals</b>	15.399	7.989	16.954

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>			<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• JD0050: DECONTAMINATION FAMILY OF SYSTEMS (DFoS)	16.384	17.050	10.804	-	10.804	9.022	11.644	16.748	36.588	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

CONTAMINATED HUMAN REMAINS SYSTEM (CHRS)

The CHRS program will leverage previous efforts under a Joint Urgent Operational Needs Statement (JUONS) which have accelerated the CHRT project. Additional minor design modifications, developmental and operational testing is part of the overall acquisition strategy. Product development consists of the design and prototyping of a CHRT. The contracting strategy will use the Countering Weapons of Mass Destruction Other Transaction Agreement (CWMD OTA) to procure prototype units, followed by Developmental Testing (DT). Following DT completion, an In-Process Review will be conducted. A Logistics Demonstration (LD) and Operational Testing (OT) will be conducted. An Operational Test Agency (OTA) Evaluation Report (OER) will be written, and technical reviews will be conducted, in preparation for a Milestone C/Full Rate Production decision.

DFoS CONTAMINATION INDICATOR DECONTAMINATION ASSURANCE SYSTEM (DFoS CIDAS)

The DFoS CIDAS program will follow an evolutionary acquisition strategy in consonance with user developed capability documents. Following MS A in 2011, the program office collaborated with external efforts, including the Hazard Mitigation, Materiel and Equipment Restoration (HaMMER) Advanced Technology Development (ATD) 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. The DFoS CIDAS program determined the need for and initiated Government designed reusable and tactical large scale applicators to provide affordable solutions to meet specific User requirements. Following MS B in 2015, the program 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 Low Rate Initial Production (LRIP) and Full Rate Production (FRP) for nerve indicator and small scale applicator systems. The program will integrate the Contractor and Government designed indicator and applicators and conduct developmental and operational testing.

DFoS CONTAMINATION INDICATOR DECON ASSURANCE SPRAY BLISTER (DFoS CIDAS BLISTER)

The DFoS CIDAS Blister program will follow an evolutionary acquisition strategy. The program office coordinated with Science and Technology efforts to identify blister technologies that met Service requirements. After further development, in 4QFY19 a sole-source performance based indefinite delivery indefinite quantity contract was awarded to develop blister indicator and small scale applicator systems with options for Low Rate Initial Production (LRIP) and Full Rate Production (FRP). The program will leverage the contract to procure blister indicator kits and conduct test and evaluation events for the EMD phase in preparation for Milestone C.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

**FORWARD AREA MOBILITY SPRAY SYSTEM (FAMS-S)**

The FAMS-S will be developed using an incremental acquisition strategy as an enabling technology for future application to include additional tactical and strategic platforms as determined by Special Operations Force (SOF). FAMS-S will reduce technological risk by reviewing existing materials and technology as well as designs, configurations, and test data from legacy systems developed for decontamination applications, including the High Mobility Decontamination System (HMDS), the M26 Joint System Tactical Decontamination System - Small Scale (JSTDS-SS), and multiple commercial systems and components currently at Technology Readiness Level (TRL) 8 and 9.

**MAJOR DEFENSE ACQUISITION PROGRAM (MDAP)**

The MDAP program provides assistance to non-CBD programs with meeting and or optimizing their Chemical, Biological, Radiological, and Nuclear (CBRN) survivability and force protection capabilities. The MDAP also provides systems engineering analyses to develop CBRN specific operational and technical requirements, identifies performance gaps between existing materiel and technical requirements, develops cost and schedule estimates, conducts preliminary CBRN T&E and logistics planning, develops CBRN defense architectures products, and performs trade space analyses for a number of non-CBD programs.

**MASS PERSONNEL DECON (MPD)**

The MPD program will develop the equipment, processes and procedures for DoD-affiliated personnel contaminated by chemical, biological, and radiological agents to achieve ambulatory and non-ambulatory throughput requirements as dictated by the needs of the Services, while considering various mission scenarios. As part of the acquisition strategy, key product developmental efforts will begin with the program achieving a MS A in 1QFY20, and includes efforts for the reduction of current MPD System costs by assessing existing Mass Casualty Decontamination (MCD) equipment and processes as well as new technology through the use of Requests For Information (RFI's), Market Research Analyses and Technology Demonstrations. Data collected from prior equipment demonstrations as well as fieldings of commercial MCD systems in support of two validated Operational Needs Statements will inform the program as well. A competitive/sole source contract for prototyping and production units will be awarded, followed by Milestone B. Results of Prototyping will inform developmental and operational testing effort, followed by Milestone C/Full Rate Production Approval. These efforts will additionally support the development of hazardous waste disposal and integration with a Contaminated Human Remains capability.

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

The JBADS acquisition approach is to leverage information and technology from the JBADS Joint Capability Technology Demonstration (JCTD) to support entry into the Engineering and Manufacturing Development (EMD) phase of the acquisition cycle. Following testing, the JBADS will transition to Full Rate Production. The JBADS will utilize Commercial-off-the-Shelf components for the shelter, the decontamination delivery system, the environmental control and monitoring system(s), and other ancillary components with the award of a competitive delivery order to produce, operate, and sustain the system. The program as a whole utilizes the evolutionary acquisition approach for future increments that may expand JBADS capabilities to include other platforms (aircraft and vehicles) as requirements dictate. The Future

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	DE5 / <i>Decontamination (SDD)</i>

Capabilities Analysis will conduct studies, analyses, and prototyping based on the current JBADS concept to improve its readiness to meet potential future requirements with minimal impact to the JBADS program.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
DFoS CIDAS - HW S - SSA/LSA - Blister/Nerve	SS/FPIF	FLIR Systems : Inc., Stillwater, OK	0.000	0.847	Feb 2019	2.344	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - HW S - Small Scale Applicators	SS/FPIF	FLIR Systems : Inc., Stillwater, OK	0.000	0.000		0.000		2.018	Dec 2020	-		2.018	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - HW S - Large Scale Applicators	MIPR	Various : Various	0.000	0.000		0.000		0.600	Dec 2020	-		0.600	Continuing	Continuing	0.000
FAMS-S - HW S - System Development and Prototype Refinement	C/CPIF	TBD : N/A	0.000	0.000		0.000		1.000	Jan 2021	-		1.000	Continuing	Continuing	0.000
MPD - HW S - Developmental Testing Assets	C/FFP	TBD : N/A	0.000	0.000		0.000		1.526	Dec 2020	-		1.526	Continuing	Continuing	0.000
JBADS - HW C - Aircraft Decontamination Units and Aircraft Enclosure	C/CPIF	AeroClave : LLC, Winter Park, FL	0.000	1.381	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	2.228		2.344		5.144		-		5.144	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
CHRS - TD/D S - IPT CHRT Support and Readiness Assessments	MIPR	Various : Various	0.000	0.000		1.626	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - TD/D S - Logistics, Engineering, and IPT Support	MIPR	Various : Various	4.621	0.292	Nov 2018	1.149	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.000	0.000		0.000		0.950	Dec 2020	-		0.950	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
FAMS-S - ES S - Systems Engineer/Technical SME Support	Various	TBD : N/A	0.000	0.000		0.000		0.472	Jan 2021	-		0.472	Continuing	Continuing	0.000
MDAP - TD/D SB - IPT and Technical Support	MIPR	Various : Various	0.475	0.326	Nov 2018	0.819	Nov 2019	0.831	Nov 2020	-		0.831	Continuing	Continuing	0.000
MPD - ES SB S - Logistics, Engineering, and IPT Support	Various	Various : Various	0.000	0.000		0.000		0.417	Jan 2021	-		0.417	Continuing	Continuing	0.000
JBADS - TD/D S - Logistics, Engineering, and IPT Support	MIPR	Various : Various	3.829	0.625	Dec 2018	0.000		0.308	Dec 2020	-		0.308	Continuing	Continuing	0.000
<b>Subtotal</b>			8.925	1.243		3.594		2.978		-		2.978	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CHRS - DTE S IPT Test & Evaluation Reporting	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.000		0.075	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - OTHT S - Live Agent / Lab, Developmental, and Operational Testing	Various	Various : Various	5.039	2.204	Nov 2018	0.169	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - OTHT S - PQT/DT/OT	MIPR	Various : Various	0.000	0.000		0.000		0.750	Dec 2020	-		0.750	Continuing	Continuing	0.000
FAMS-S - DTE SB - Decon Solution Analysis	Various	TBD : N/A	0.000	0.000		0.000		0.100	Jan 2021	-		0.100	Continuing	Continuing	0.000
MPD - DTE SB - Developmental Testing	Various	TBD : N/A	0.000	0.000		0.000		1.080	Mar 2021	-		1.080	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
JBADS - OTE S - Initial Operational Test and Evaluation	C/CPIF	AeroClave : LLC, Winter Park, FL	0.000	0.000		0.000		3.183	Dec 2020	-		3.183	Continuing	Continuing	0.000
JBADS - Future Capability Analysis/MIL-STD 810-G Test Planning/Testing/ other T&E activities	Various	Various : Various	0.000	1.157	May 2019	0.078	Dec 2019	0.300	Dec 2020	-		0.300	Continuing	Continuing	0.000
JBADS - Contractor Specification Testing/MIL-STD 810-G support	C/CPIF	AeroClave : LLC, Winter Park, FL	0.000	4.998	Jan 2019	0.100	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JBADS - OTHT S - Prototype Testbed Capability Development	C/CPFF	Advanced Technologies International : Summerville, SC	0.000	1.381	Jul 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			5.039	9.740		0.422		5.413		-		5.413	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
CHRS - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.000	0.000		0.417	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - PM/MS S - Program Management Support	MIPR	Various : Various	2.360	0.703	Nov 2018	0.964	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS BLISTER - PM/MS S - Program Management Support	MIPR	Various : Various	0.000	0.000		0.000		1.149	Dec 2020	-		1.149	Continuing	Continuing	0.000
FAMS-S - PM/MS S - Indirect Program Management	Various	TBD : N/A	0.000	0.000		0.000		0.256	Jan 2021	-		0.256	Continuing	Continuing	0.000









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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 - Initial Operational Test and Evaluation (IOT&E)																												
JBADS - Full Rate Production (FRP)																												
JBADS - Initial Operational Capability (IOC)																												
JBADS - Milestone C																												
JBADS - Full Operational Capability																												

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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**Schedule Details**

Events	Start		End	
	Quarter	Year	Quarter	Year
CHRS - Developmental Test (DT)	1	2019	1	2020
CHRS - Capability Development Document (CDD) - CHRT	2	2019	2	2019
CHRS - Critical Design Review (CDR) - CHRT	4	2019	4	2019
CHRS - Operational Test (OT) - CHRT	4	2019	4	2019
CHRS - Joint Independent Logistics Assessment (JILA) - CHRT	2	2020	3	2020
CHRS - Type Classification/Material Release - CHRT	3	2020	3	2020
CHRS - MS C- CHRT	3	2020	3	2020
CHRS - Full Rate Production (FRP) - CHRT	3	2020	3	2020
CHRS - Initial Operational Capability (IOC) - CHRT	3	2021	3	2021
CHRS - Full Operational Capability (FOC) - CHRT	3	2022	3	2022
DFoS - CIDAS JILA - Joint Independent Logistics Assessment (Nerve Indicator)	3	2019	4	2019
DFoS - CIDAS LSA DT	3	2019	4	2020
DFoS - CIDAS SSA-Blister DT	1	2020	4	2020
DFoS - CIDAS SSA-Nerve Milestone C	4	2020	4	2020
DFoS - CIDAS SSA-Nerve Full Rate Production (FRP)	4	2020	4	2020
DFoS CIDAS BLISTER - PQT/DT/OT	1	2021	4	2021
DFoS CIDAS BLISTER - Milestone C	2	2022	2	2022
DFoS CIDAS BLISTER - Full Rate Production (FRP)	2	2022	2	2022
DFoS CIDAS BLISTER - Initial Operational Capability (IOC)	1	2024	1	2024
FAMS-S - System Development and Prototype Refinement	2	2021	3	2022
FAMS-S - DT/OT	4	2021	4	2022
FAMS-S - MS C	1	2023	1	2023

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
FAMS-S - Low Rate Initial Production	1	2023	3	2023
FAMS-S - Full Rate Production	4	2023	4	2025
FAMS-S - IOC	2	2025	2	2025
MDAP - Armored Multi-Purpose Vehicle (AMPV) LRIP	1	2019	4	2021
MDAP - European Reassurance Initiative (ERI) CBRN equipment	1	2019	2	2020
MDAP - Armored Multi-Purpose Vehicle (AMPV) FRP	3	2021	4	2023
MDAP - Optionally Manned Fighting Vehicle (OMFV) RFP 1	1	2019	2	2020
MDAP - Optionally Manned Fighting Vehicle (OMFV) RP Contract	2	2020	2	2022
MDAP - Optionally Manned Fighting Vehicle (OMFV) RFP 2	2	2022	3	2023
MDAP - Optionally Manned Fighting Vehicle (OMFV) LRIP	3	2023	4	2025
MDAP - Robotic Combat Vehicle Experimental Prototype Build	3	2019	3	2023
MDAP - Future Long Range Assault Aircraft (FLRAA)	1	2019	4	2025
MDAP - Future Attack Reconnaissance Aircraft (FARA)	1	2019	4	2025
MPD - Systems Engineering Plan (SEP)	4	2019	4	2019
MPD - Life Cycle Sustainment Plan (LCSP)	1	2020	1	2020
MPD - MS A	2	2020	2	2020
MPD - Request for Proposal (RFP)	2	2020	2	2020
MPD - Contract Award	2	2020	2	2020
MPD - Prototype Testing	3	2020	1	2021
MPD - MS B	1	2021	1	2021
MPD - Acquisition Program Baseline (APB)	1	2021	1	2021
MPD - Test Evaluation Master Plan (TEMP)	1	2021	1	2021
MPD - Contract Option	2	2021	2	2021
MPD - Critical Design Review (CDR)	2	2021	2	2021
MPD - Development Test (DT)	3	2021	1	2022

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
MPD - In Process Review (IPR)	1	2023	1	2023
MPD - Operational Test (OT)	4	2022	2	2023
MPD - Initial Operational Test and Evaluation (IOT&E)	4	2022	2	2023
MPD - MS C	4	2023	4	2023
MPD - Full Rate Production (FRP)	4	2023	4	2023
MPD - Initial Operational Capability (IOC)	3	2024	3	2024
JBADS - Contractor Specification Testing	2	2019	1	2020
JBADS - MIL-STD 810-G Testing	4	2019	4	2019
JBADS - First System Build	1	2020	3	2020
JBADS - Product Verification Testing (PVT)	3	2020	4	2020
JBADS - Initial Operational Test and Evaluation (IOT&E)	3	2021	4	2021
JBADS - Full Rate Production (FRP)	2	2022	2	2022
JBADS - Initial Operational Capability (IOC)	2	2022	2	2022
JBADS - Milestone C	2	2022	2	2022
JBADS - Full Operational Capability	2	2024	2	2024

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
IP5: Individual Protection (SDD)	-	10.597	12.663	12.960	-	12.960	12.858	12.796	8.963	8.436	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.

Efforts included in this project are:

- (1) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD)
- (2) Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS)
- (3) UIPE FoS General Purpose (GP)
- (4) Joint Service Aircrew Mask for Strategic Aircraft (JSAM SA)
- (5) JSAM for Tactical Aircraft (JSAM TA)

SPU RCDD will facilitate rapid response to near-term and emergent chemical-biological defensive capability requirements from elements of the Joint Special Operations Command (JSOC), select elements from across the Special Operations Force (SOF) Enterprise such as Combatant Commanders Response Forces (CRFs) and other Joint Force enabling units such as the 20th Chemical, Biological, Radiological, Nuclear and Explosives Command. SPU RCDD mitigates risk across the Chemical Biological Defense Program (CBDP) by creating a portfolio of operationally-relevant chemical and biological (CB) capabilities that can be quickly transitioned to needed elements and formations of the joint force, in whole or part, in response to the articulated, emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T) from the Joint Science and Technology Office (JSTO) and the Defense Advanced Research Projects Agency (DARPA) among others; the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability; and the active leveraging of existing Commercial-Off-The-Shelf (COTS) products along with novel redesign approaches to optimize existing solutions to new challenges supported by "buy-try-decide-acquire" acquisition strategies. Projects being initiated or continued in FY21 include 1) modular and micro Powered Air Purifying Respirators (PAPR) that will provide users an improved form-fit over the existing C420 PAPR configuration, be of smaller size and weight than the C420, and extend the filter and battery life beyond current capability so users may continue operating in a CB-contaminated environment unencumbered, and 2) CBRND protective equipment in response to new and emerging threats and opportunities.

UIPE FoS will develop a family of systems that will provide the broad spectrum of users with individual percutaneous protective equipment allowing the ability to operate in a contaminated environment with no or minimal degradation in performance. UIPE FoS will provide protection from operationally relevant traditional and non-traditional CBRN threats likely to be encountered during joint force operations.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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> IP5 / <i>Individual Protection (SDD)</i>
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In FY21, UIPE FoS transitions to UIPE FoS General Purpose (GP), UIPE FoS Air and UIPE FoS Gloves. In order to reflect the structure of the program, UIPE FoS will meet Mission Area needs, not individual Service needs. The four Mission Areas are: Land, Air, Sea, and Homeland Defense. Each of the Mission Areas have unique mission requirements that the UIPE FoS GP, Air and Gloves solutions will fulfill.

UIPE FoS GP will provide a family of systems that will give the Warfighter percutaneous protection from operationally relevant traditional, non-traditional, and advanced CBRN/Toxic Industrial Material (TIM) threats likely to be encountered during joint force operations. The family of systems is being developed based on agreed upon Service Mission Areas of which there are four: Land, Sea, Air, and Homeland Defense. Each of the Mission Areas have unique mission requirements that the combined UIPE FoS solutions will fulfill. The overarching goal of each of the four Mission Areas is to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems. The Tactical All-Hazards Threat Protective Ensemble (TATPE) will be a subset to the UIPE FoS GP and capitalize on the protection factor of commercial Level A with design modifications to align with the necessary operational requirements. This suit serves as an additional tool in the arsenal until technology matures to the point of delivering a similar capability applied against the range of military operations in all environments under all conditions.

The JSAM SA and JSAM TA are Acquisition Category (ACAT) III programs developed to provide respiratory and ocular protection. The JSAM family is a lightweight Chemical, Biological, Radiological and Nuclear (CBRN) protective mask for most United States Army (USA), Navy (USN), Air Force (USAF), and Marine Corps (USMC) rotary wing and fixed wing 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. These masks posture all aircrew to operate in an actual or perceived CB domain as directed in the 2018 National Defense Strategy.

The JSAM SA 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, aircrew flight equipment, aircraft seating, portable aircrew systems, communications systems, and aircraft oxygen systems. The JSAM SA mask will provide individual respiratory, ocular, and percutaneous protection of chemical and biological warfare agents, and select Toxic Industrial Chemicals (TICs) 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, 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 JSAM TA will provide chemical biological protection for aircrew of high performance, ejection seat tactical aircraft. 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. The JSAM TA mask will provide individual respiratory, ocular, and percutaneous protection of chemical and biological warfare agents, and select Toxic Industrial Chemicals (TICs) for USAF (F-22 A), USN (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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
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.				
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Special Purpose Unit Rapid Capability Development & Deployment (SPU RCDD) <b>Description:</b> Development of specialized equipment for agent specific threats.  <b>FY 2020 Plans:</b> Initiate rapid development and acquisition initiatives utilizing emergent chemical-biological defensive capabilities, decision support tools, and respiratory/ocular enhancements to support Special Operations Force (SOF) counter-proliferation efforts and development of decontamination of SOF specialized equipment.  <b>FY 2021 Plans:</b> Continue developing, prototyping, and maturing CBRND technologies to rapidly equip users with capabilities in response to new and emerging threats and opportunities.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters.		-	3.399	4.537
<b>Title:</b> 2) Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS) <b>Description:</b> Engineering and Manufacturing Development (EMD)  <b>FY 2020 Plans:</b> Receive Contract Award for production, receive USN/USMC Fielding Decision Point Conduct Initial Operational Test and Evaluation (IOT&E) for the Navy/Marine Corps, receive Operational Test Agency Evaluation Report (OER).  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (UIPE FoS GP)		5.852	4.737	-
<b>Title:</b> 3) UIPE FoS <b>Description:</b> System Development and Demonstration/Engineering and Manufacturing Development of Tactical All-Hazards Threat Protective Ensemble (TATPE)  <b>FY 2020 Plans:</b>		1.100	3.400	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Continue prototype refinement based on user input/feedback, complete entrance criteria for a MS B decision, and initiate combined DT/OT. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Advanced Development.				
<b>Title:</b> 4) UIPE FoS General Purpose (GP) <b>Description:</b> Development of the next generation protective ensembles (e.g., suits, boots, and gloves) and respiratory and ocular protection equipment (e.g., protective masks) <b>FY 2021 Plans:</b> Achieve Milestone B and award a contract for the Engineering and Manufacturing Development (EMD) phase; conduct a Manufacturing Readiness Assessment(MRA); and begin Developmental/Operational Testing (DT/OT). <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (UIPE FoS)		-	-	4.328
<b>Title:</b> 5) UIPE FoS Tactical All-Hazards Threat Protective Ensemble (TATPE) <b>Description:</b> TATPE system development, developmental testing, and operational assessment. <b>FY 2021 Plans:</b> Complete EMD phase to include system level testing and user evaluations. Complete MS C documentation to include final assessment, analysis and system documentation. Mission area focus includes: Land, Sea, and Homeland Defense. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (UIPE FoS)		-	-	2.950
<b>Title:</b> 6) Joint Service Aircrew Mask for Strategic Aircraft (JSAM SA) <b>Description:</b> Operational Testing and Evaluation (OT&E) <b>FY 2020 Plans:</b> Continue Operational Testing (OT), Integration Testing and Safe-to-Fly on various Service aircraft. Continue engineering studies to assess communication system adaptors and oxygen system adaptors for various Service aircraft. Continue updates to the Technical Manual (TM) to include specialized procedures for the various aircraft tested. <b>FY 2021 Plans:</b>		1.627	1.127	1.145

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Continue OT, Integration Testing and Safe-to-Fly on various Service aircraft. Continue updates to the TM to include specialized procedures for the various aircraft based on testing results. Continue engineering studies to assess communication system adaptors and oxygen system adaptors for remaining aircraft.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.			
<b>Title:</b> 7) Joint Service Aircrew Mask for Tactical Aircraft (JSAM TA)	2.018	-	-
<b>Description:</b> Integration Testing Events and Milestone C Preparation			
<b>Accomplishments/Planned Programs Subtotals</b>	10.597	12.663	12.960

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• JI0002: JS AIRCREW MASK (JSAM)	50.214	56.846	72.550	-	72.550	67.325	50.412	8.247	0.000	0.000	305.594
• MA0401: CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)	12.264	14.984	1.492	-	1.492	0.457	0.000	0.000	0.000	0.000	29.197

**Remarks**

**D. Acquisition Strategy**

SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)

Non-traditional projects will be executed for capabilities identified by Joint Special Operations Command (JSOC), select elements from across the Special Operations Forces (SOF) Enterprise, and other Joint Force enabling units. The SPU RCDD BA5 acquisition strategy for developmental efforts will allow rapid prototyping and testing of mission critical capabilities needed to enhance mission success. The SPU RCDD BA7 modernization effort will use technical and functional evaluations of currently-fielded items to introduce and incorporate operationally-relevant system developments. Both efforts will be accomplished by awarding an agreement through the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the procurement of test assets. An OTA contracting approach will be used to procure test 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 OTAs, a Small Business Innovative Research contract, or a more traditional contracting vehicle.

CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE FAMILY OF SYSTEMS (UIPE FOS)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

The UIPE FoS program will conduct market research through both Requests For Information (RFIs) and a call for White Papers through an Other Transaction Authority (OTA) contracting approach. Candidate technologies will follow the same acquisition strategy employed for the suit: Early User Tests/Wear events and material and system level testing to identify available capabilities followed by a Trade Space Analysis to determine the most suitable glove(s). The UIPE FoS GP program will monitor S&T activities for possible technology transitions.

In FY21, UIPE FoS transitions to UIPE FoS GP, UIPE FoS Air and UIPE FoS Gloves. In order to reflect the structure of the program, UIPE FoS will meet Mission Area needs, not individual Service needs. The four Mission Areas are: Land (i.e. GP), Air, Sea, and Homeland Defense. Each of the Mission Areas has unique mission requirements that the UIPE FoS GP, Air and Gloves solutions will seek to fulfill.

**UNIFORM INTEGRATED PROTECTIVE ENSEMBLE GENERAL PURPOSE (UIPE FOS GP)**

The UIPE FoS GP program utilized an Other Transaction Authority (OTA) contracting approach to procure informational white papers during the Technology Maturation and Risk Reduction (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. The OTA yielded several different prototypes that are undergoing material and system level testing and Early User Tests. Along with the OTA prototypes, the program is exploring the feasibility of a layered concept designed by the government and a manufacturing partner.

**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 Research Development Test & Evaluation (RDT&E) contract was awarded via sole source to Avon Protection Systems, Cadillac, Michigan to modify and field a commercially available mask (M53).

The overall acquisition strategy is to 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 Initial Operating Capability (IOC) fielding to USAF, USN, and USA aircrew. The final test phase will consist of Integration and Airworthiness Certification (I&AC) testing for all remaining aircraft.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)</i>
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The contract strategy consists of two sole-source contracts with Avon Protection Systems, the manufacturer of the fielded M53 mask. The first contract, which was awarded on 31 July 2013, covers all activities during the Engineering and Manufacturing Development (EMD) phase to include all LRIP builds. The second contract, which was awarded on 4 January 2019 to Avon Protection Systems, will cover the activities during the Production and Deployment (PD) phase including all Full Rate Production (FRP) builds for the Services.

**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) 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, awarded September 2016, covers all activities during the Engineering, Manufacturing, and Development (EMD) phase. The second contract awarded, September 2019, is a sole source FFP Indefinite Delivery/Indefinite Quantity (ID/IQ) that covers the activities during the Production and Deployment phase including Full Rate Production (FRP) builds. The JSAM TA mask is intended to be fielded to the USN and USMC.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
SPU RCDD - HW C - Prototype Procurement	Various	Various : Various	0.000	0.000		1.510	Dec 2019	2.016	Dec 2020	-		2.016	Continuing	Continuing	0.000
UIPE FOS - HW S - TATPE system development, fabrication, and swatch and system level technical testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.621	Jan 2019	1.640	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - HW S - UIPE FoS Prototype Development	Various	Various : Various	0.000	0.000		1.795	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS GP - HW S - TATPE System Development	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		2.050	Nov 2020	-		2.050	Continuing	Continuing	0.000
UIPE FOS GP - HW C - Prototype Development	MIPR	TBD : N/A	0.000	0.000		0.000		0.025	Dec 2020	-		0.025	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.621		4.945		4.091		-		4.091	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
SPU RCDD - TD/D C - Technical Support	Various	Various : Various	0.000	0.000		0.342	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
SPU RCDD - ES C - Engineering Support	Various	Various : Various	0.000	0.000		0.335	Dec 2019	0.458	Dec 2020	-		0.458	Continuing	Continuing	0.000
UIPE FOS - ES S - Logistics, Engineering and IPT Support	Various	Various : Various	0.000	1.889	Apr 2019	1.773	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - ES S - TATPE Integrated Product Team (IPT) Program, Engineering and Technical Support	MIPR	Various : Various	0.000	0.279	Jan 2019	0.685	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
UIPE FOS GP - ES S - TATPE Engineering & Technical IPT Support / SME Support	Various	Various : Various	0.000	0.000		0.000		0.300	Nov 2020	-		0.300	Continuing	Continuing	0.000
UIPE FOS GP - ES C - Engineering & Technical IPT Support / SME Support	Various	Various : Various	0.000	0.000		0.000		1.280	Dec 2020	-		1.280	Continuing	Continuing	0.000
JSAM SA - TD/D S - Logistics, Engineering, and IPT Support	MIPR	Various : Various	0.116	0.674	Dec 2018	0.120	Feb 2020	0.130	Dec 2020	-		0.130	Continuing	Continuing	0.000
JSAM TA - ES S - Logistics, Engineering and IPT Support	MIPR	Various : Various	6.252	1.524	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			6.368	4.366		3.255		2.168		-		2.168	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
SPU RCDD - OTE S - Operational Assessment	MIPR	National Assessment Group : Kirkland, NM	0.000	0.000		0.000		0.500	Dec 2020	-		0.500	Continuing	Continuing	0.000
SPU RCDD - DTE C - Testing and Evaluation	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.665	Dec 2019	0.435	Dec 2020	-		0.435	Continuing	Continuing	0.000
UIPE FOS - DTE S - System Level Testing	Various	Various : Various	0.000	3.155	Dec 2018	0.257	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - OTHS - TATPE Testing for chemical warfare agent and toxic industrial	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.200	Jan 2019	1.075	Apr 2020	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
chemical swatch level testing															
UIPE FOS GP - DTE C - DT/OT	Various	Various : Various	0.000	0.000		0.000		1.499	Dec 2020	-		1.499	Continuing	Continuing	0.000
UIPE FOS GP - OTE S - TATPE User Evaluation	Various	Various : Various	0.000	0.000		0.000		0.400	Nov 2020	-		0.400	Continuing	Continuing	0.000
UIPE FOS GP - DTE S - TATPE Technical Testing	Various	Various : Various	0.000	0.000		0.000		0.200	Nov 2020	-		0.200	Continuing	Continuing	0.000
JSAM SA - DTE S - DT/OT	MIPR	Various : Various	2.193	0.513	Nov 2018	0.770	Nov 2019	0.774	Dec 2020	-		0.774	Continuing	Continuing	0.000
JSAM TA - DTE S -Testing and Integration	MIPR	Various : Various	4.179	0.127	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			6.372	3.995		2.767		3.808		-		3.808	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
SPU RCDD - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.547	Nov 2019	1.128	Nov 2020	-		1.128	Continuing	Continuing	0.000
UIPE FOS - MS S - PM/SME Program Management Support	MIPR	Various : Various	0.000	0.808	Dec 2018	0.912	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS GP - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		1.524	Dec 2020	-		1.524	Continuing	Continuing	0.000
JSAM SA - PM/MS S - Program Management Support	MIPR	Various : Various	0.974	0.440	Nov 2018	0.237	Feb 2020	0.241	Dec 2020	-		0.241	Continuing	Continuing	0.000
JSAM TA - PM/MS S - Program Management Support	MIPR	Various : Various	2.073	0.367	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000





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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 FOS GP - Capability Development Document (CDD)										■																		
UIPE FOS GP - Test & Evaluation Master Plan (TEMP) Update										■																		
UIPE FOS GP - Milestone B										■																		
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)											■																	
UIPE FOS GP - EMD Phase Contract											■																	
UIPE FOS GP - Make or Buy Decision											■																	
UIPE FOS GP - DT/OT												■	■	■	■													
UIPE FOS GP - CDD Update															■													
UIPE FOS GP - Milestone C																■												
UIPE FOS GP - LRIP																■												
UIPE FOS GP - Initial Operational Capability (IOC)																						■						
UIPE FOS GP - FRP																							■					
UIPE FOS GP - Full Operational Capability (FOC)																										■		
UIPE FOS GP - TATPE User Evaluation											■																	
UIPE FOS GP - TATPE Technical Testing											■																	
UIPE FOS GP - TATPE Milestone C												■																
UIPE FOS GP - TATPE IOC													■															
UIPE FOS GP - TATPE FOC																										■		
JSAM SA - DT/OT (Capability, Integration, Airworthiness Certification)																												
JSAM SA - Initial Operational Capability (IOC)																										■		
JSAM SA - Full Operational Capability (FOC)																											■	



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SPU RCDD - Development Efforts	1	2020	4	2025
UIPE FOS - Air Material Testing	1	2019	4	2020
UIPE FOS - Air Design Reviews	1	2019	3	2020
UIPE FOS - Air System Testing	1	2019	1	2020
UIPE FOS - Air Worthiness Certification	1	2019	4	2019
UIPE FOS - Air System Verification Review	3	2019	3	2019
UIPE FOS - Air Capability Development Document (CDD)	3	2019	3	2019
UIPE FOS - Air RFP	2	2020	2	2020
UIPE FOS - Air MRA	2	2020	2	2020
UIPE FOS - Air MS C	2	2020	2	2020
UIPE FOS - Air LRIP/USAF Fielding Decision	2	2020	2	2020
UIPE FOS - Air USN/USMC Initial OT&E	2	2020	2	2020
UIPE FOS - Air Production Award	3	2020	3	2020
UIPE FOS - Air Operational Test Agency Evaluation Report (OER)	4	2020	4	2020
UIPE FOS - Air PRR	4	2020	4	2020
UIPE FOS - TATPE Technical Evaluation	1	2019	1	2019
UIPE FOS - TATPE Concept System Refinement and Fabrication	2	2019	4	2019
UIPE FOS - TATPE CDD	4	2019	4	2019
UIPE FOS - TATPE DT/OT	4	2019	1	2021
UIPE FOS - TATPE Milestone B	2	2020	2	2020
UIPE FOS - TATPE User Evaluation	4	2020	4	2020
UIPE FOS GP - Capability Development Document (CDD)	2	2021	2	2021

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
UIPE FOS GP - Test & Evaluation Master Plan (TEMP) Update	2	2021	2	2021
UIPE FOS GP - Milestone B	2	2021	2	2021
UIPE FOS GP - Manufacturing Readiness Assessment (MRA)	3	2021	3	2021
UIPE FOS GP - EMD Phase Contract	3	2021	3	2021
UIPE FOS GP - Make or Buy Decision	3	2021	3	2021
UIPE FOS GP - DT/OT	4	2021	3	2022
UIPE FOS GP - CDD Update	4	2022	4	2022
UIPE FOS GP - Milestone C	1	2023	1	2023
UIPE FOS GP - LRIP	1	2023	1	2023
UIPE FOS GP - Initial Operational Capability (IOC)	4	2023	4	2023
UIPE FOS GP - FRP	4	2023	4	2023
UIPE FOS GP - Full Operational Capability (FOC)	4	2024	4	2024
UIPE FOS GP - TATPE User Evaluation	1	2021	1	2021
UIPE FOS GP - TATPE Technical Testing	1	2021	1	2021
UIPE FOS GP - TATPE Milestone C	2	2021	2	2021
UIPE FOS GP - TATPE IOC	4	2021	4	2021
UIPE FOS GP - TATPE FOC	4	2024	4	2024
JSAM SA - DT/OT (Capability, Integration, Airworthiness Certification)	1	2019	1	2022
JSAM SA - Initial Operational Capability (IOC)	4	2020	4	2020
JSAM SA - Full Operational Capability (FOC)	2	2025	2	2025
JSAM TA - AP22P (A) Safe to Fly Certification	1	2019	3	2020
JSAM TA - Integrated (Developmental/Operational) Testing (DT/OT)	1	2019	2	2019
JSAM TA - AP22P (A) ECP Integration	1	2019	1	2019
JSAM TA - Capability Development Document Update (CDD)	3	2019	3	2019
JSAM TA - MS C	4	2019	4	2019

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
JSAM TA - Full Rate Production (FRP)	4	2019	4	2019
JSAM TA - Initial Operational Capability(IOC)	2	2021	2	2021
JSAM TA - USN/USMC Full Operational Capability (FOC)	4	2024	4	2024

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
IS5: Information Systems (SDD)	-	21.993	21.166	6.019	-	6.019	5.691	5.232	5.232	5.493	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) Global Biosurveillance Portal (Global-BSP)
- (2) Chemical Biological Radiological and Nuclear Information Systems (CBRN IS)
- (3) Joint Effects Model 2 (JEM 2)
- (4) Joint Warning and Reporting Network 2 (JWARN 2), and
- (5) Software Support Activity (SSA).

The Global-BSP is an unclassified, web-based computer and mobile application which facilitates collaboration, communication, and information sharing in support of the preparedness, detection, management, and mitigation of CBRN, as well as all hazard events. These capabilities enable the use of data visualization, real-time messaging and file sharing, and DoD and USG cooperation to expedite the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

CBRN IS provides a collaborative Cloud hosted environment that allows users to collect and disseminate CBRN warning and reporting data, provide detailed CBRN hazard predictions, aid in decision support, and make relevant CBRN defense information available in near-real time. CBRN IS provides an environment that supports the implementation of Integrated Early Warning (IEW) capabilities that allow users to access netted sensor information, data fusion, disease modeling, biosurveillance data, source term estimation data, incident management tools, and planning and analysis capabilities. The CBRN IS enterprise makes CBRN decision aids readily accessible from any desktop through a web browser simplifying interoperability, reducing integration and deployment costs and increases cybersecurity protection.

The JEM 2 is a software application that provides the Department of Defense (DoD) with the only operationally tested and accredited tool to model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. JEM 2 applies advanced physics using weather, terrain, and agent characteristics to predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM). JEM 2 displays hazard information on the Common Operational Picture (COP) and allows commanders to assess risk and take steps mitigate the effects of Weapons of Mass Destruction (WMD) on operational forces.

The JWARN 2 is a software application that provides the Department of Defense warning and reporting system that enables an immediate and integrated response to threats of contamination by WMD, CBRN and TIM incidents. JWARN 2 provides a digital display of CBRN reports on the COP, presented through Service provided

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Command and Control systems resident at all echelons of command. Commanders will be provided with enhanced situational battlespace awareness and support warfighter battle management and continuity of operations in a contaminated environment.

The SSA provides for enterprise services in the areas of software development, network architecture, cybersecurity, technology transition, and information assurance standards and policies to support programs in conducting network architecture integration, technology transition insertion, and continued cybersecurity risk management framework efforts throughout the CBRND portfolio within the EMD/LRIP phase.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) Global Biosurveillance Portal (Global-BSP)</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Finalize development of FVEY(Five Eyes - US/UK/Canada/Australia/New Zealand)/NATO role-based access capability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	4.116	3.047	-
<p><b>Title:</b> 2) Global-BSP</p> <p><b>Description:</b> Developmental Test and Evaluation</p> <p><b>FY 2020 Plans:</b> Conduct Developmental and Operational T&amp;E events on new FVEY and NATO role-based access capabilities, as well as conduct Final Operational Test in preparation for Full Operational Capability Fielding Decision.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	0.358	0.295	-
<p><b>Title:</b> 3) Global-BSP</p> <p><b>Description:</b> Program Management Support</p> <p><b>FY 2020 Plans:</b> Manage and conduct oversight of all aspects of Global-BSP program development and testing. Tasks include planning, budgeting, execution oversight, risk management, test and user feedback coordination, scheduling, training and administration.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	0.793	0.466	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<p><b>Title:</b> 4) Global-BSP</p> <p><b>Description:</b> Operational Testing and Evaluation</p> <p><b>FY 2020 Plans:</b> Conduct Final Operational Test &amp; Evaluation (FOT&amp;E) associated with Full Operational Capability. Conduct Operational Testing of Global-BSP with one Production Capability Drop End-to-End test to validate capabilities prior to delivery to the Warfighter. Support will consist of test, engineering, and operational personnel support. Conduct multiple User Feedback Events (UFEs). UFEs provide a crucial link between the Program Managers, Engineers, and Operators.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.928	0.655	-
<p><b>Title:</b> 5) Global-BSP</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b> Perform Training Development, Integrated Logistic Support, and Configuration Management.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		-	0.199	-
<p><b>Title:</b> 6) Chemical Biological Radiological and Nuclear Information Systems (CBRN IS)</p> <p><b>Description:</b> Technical Guidance</p> <p><b>FY 2020 Plans:</b> Provide the management and systems engineering for Integrated Early Warning, Decision Support/ Consequence and Incident Management, Data Analytics and other situational understanding and awareness tools. Ensure adherence to the Joint Operational Environment standards and Cyber Security requirements. Provide strategy for integration of future capabilities and emerging requirements including advanced technology demonstrations (ATDs) and experimental capability demonstrations (ECDs).</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		0.226	0.217	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.			
<p><b>Title:</b> 7) CBRN IS</p> <p><b>Description:</b> Standardization</p> <p><b>FY 2020 Plans:</b> Provide guidance and direction to ensure new capabilities meet industry and program standards for integration. Ensure development and integration efforts are compliant and compatible with the Joint Information Environment (JIE) and Service common operational and common computing environments. Comply with DoD and Service specified Cybersecurity and Net Ready Key Performance Parameters.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	0.362	0.575	-
<p><b>Title:</b> 8) CBRN IS</p> <p><b>Description:</b> Cybersecurity / Information Assurance</p> <p><b>FY 2020 Plans:</b> Continue the implementation of ongoing cybersecurity requirements and policies and DoD information assurance vulnerability alerts (IAVAs) to mitigate system vulnerabilities. Continue adversarial and cooperative vulnerability testing.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	0.210	0.203	-
<p><b>Title:</b> 9) CBRN IS</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Continue to develop additional capabilities, applications and implementations to support the National Defense priorities for combating weapons of mass destruction. Continue to integrate CBRND products into a family-of-systems (FOS) framework. Continue to refine sensor connectivity prototype.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	1.059	1.025	-
<p><b>Title:</b> 10) CBRN IS</p> <p><b>Description:</b> Operational Assessments</p>	0.620	0.480	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Continue operational test and evaluations and user feedback events in accordance with product and application test plans to assess and validate capabilities prior to implementing in the production enterprise environment. Tests will assess accessibility, bandwidth/throughput, and reliability to meet program KPPs and KSAs. Continue cyber security and vulnerability testing.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>			
<p><b>Title:</b> 11) CBRN IS</p> <p><b>Description:</b> Product Development, Operational Assessments, Management, Engineering, and Cybersecurity Support</p> <p><b>FY 2021 Plans:</b> Continue operational test and user feedback events to assess and validate capabilities prior to implementing in the production environment. Continue operational test and evaluations in order to meet Key Performance Parameters (KPP) and Key System Attributes (KSA). Provide management and system engineering oversight and integration of future capabilities and emerging requirements including advanced technology demonstrations (ATDs) and experimental capability demonstrations (ECDs). Ensure development and integration efforts are compliant and compatible with the Joint Information Environment (JIE) and Service common operational and common computing environments. Continue the implementation of ongoing cybersecurity requirements and policies and DoD information assurance vulnerability alerts (IAVAs) to mitigate system vulnerabilities. Continue adversarial and cooperative vulnerability testing.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	-	-	3.131
<p><b>Title:</b> 12) Joint Effects Model 2 (JEM 2)</p> <p><b>Description:</b> Developmental Test and Evaluation</p> <p><b>FY 2020 Plans:</b> Continue Government Development Test of software deliveries in preparation for Initial Operational Test &amp; Evaluation (IOT&amp;E) for development to C2 systems. Continue to perform VV&amp;A of new hazard prediction models provided by the S&amp;T community as defined in RDP-4.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	0.150	0.420	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<p><b>Title:</b> 13) JEM 2</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Continue development of JEM 2 software and perform integration into C2 systems. Integrate new hazard prediction models provided by the S&amp;T community into the JEM 2 baseline software and develop/transition new S&amp;T capabilities as defined in Requirements Definition Package RDP-4.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		1.530	1.443	-
<p><b>Title:</b> 14) JEM 2</p> <p><b>Description:</b> Program Management</p> <p><b>FY 2020 Plans:</b> Continue to perform program/financial management, costing, contracting, scheduling and acquisition oversight support for JEM 2. Continue development and execution of JEM 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 2 to the services and to the Science and Technology Community.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.198	0.521	-
<p><b>Title:</b> 15) JEM 2</p> <p><b>Description:</b> Operational Test and Evaluation</p> <p><b>FY 2020 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 2 software which will allow for additional CDs with added JEM capabilities and functionality to be deployed to the services.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		0.430	0.782	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<p><b>Title:</b> 16) JEM 2</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b> Perform Training Development, Integrated Logistics Support and Configuration Management for upgraded fielded capabilities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.242	0.842	-
<p><b>Title:</b> 17) Joint Warning and Reporting Network 2 (JWARN 2)</p> <p><b>Description:</b> Management Support</p> <p><b>FY 2020 Plans:</b> Provide program/financial management, costing, contracting, scheduling, acquisition and deployment oversight for JWARN. Continue software development, integration, and deployment of JWARN capabilities in the milCloud CBRN IS enterprise environment and Services Command and Control systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.821	0.834	-
<p><b>Title:</b> 18) JWARN 2</p> <p><b>Description:</b> Product Development</p> <p><b>FY 2020 Plans:</b> Continue JWARN 2 software development and perform integration into Command and Control and integration of CBRN sensor/detector data/input with JWARN software baseline. Transition False Sensor Alert Reduction prototyping into JWARN software development. Continue Information Assurance Certification and accreditation to support cybersecurity deployment of JWARN 2 in the milCloud CBRN IS enterprise environment and Service Command and Control systems. Continue software development in preparation for Operational Test and Evaluation (OT&amp;E) for USMC and Navy systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		4.415	5.002	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<p><b>Title:</b> 19) JWARN 2</p> <p><b>Description:</b> Developmental Test and Evaluation</p> <p><b>FY 2020 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 2 to be deployed to the services. Conduct development test and evaluation of JWARN 2 in preparation for OT&amp;E for development to COE v3.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.300	0.567	-
<p><b>Title:</b> 20) JWARN 2</p> <p><b>Description:</b> Operational Test and Evaluation</p> <p><b>FY 2020 Plans:</b> Conduct Multiservice Operational Test &amp; Evaluation (MOT&amp;E), which will allow for additional capability drops (CDs) with added JWARN capabilities and functionality to be deployed to the services. Conduct IOT&amp;E of JWARN in preparation for deployment to Navy and Marine Corps C2 systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.625	0.850	-
<p><b>Title:</b> 21) JWARN 2</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b> Provide New Equipment Training to operational users in US Army, Air Force, Navy, and Marine Corps in accordance with Services' Fielding and Training Plans, as JWARN approaches Full Operational Capability across all services. Continue to coordinate with operational forces for User Feedback Events, improving user interface and creating more efficient operational experience.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>		1.604	1.084	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (SDD)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<p><b>Title:</b> 22) Software Support Activity (SSA)</p> <p><b>Description:</b> Policies, Standards and Guidelines</p> <p><b>FY 2020 Plans:</b> 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. Help programs achieve a mandated net-centric environment by providing enabling tools for data management.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>		0.313	0.064	-
<p><b>Title:</b> 23) SSA</p> <p><b>Description:</b> Integrated Architecture</p> <p><b>FY 2020 Plans:</b> Continue to create, implement, validate, maintain, and continually shape a set of standard, enterprise-wide integrated CBRN Family of Systems architectures. Assists in development of acquisition program documents by providing early architecture products for inclusion and assists in the analysis and management of acquisition programs by producing architectural products that visualize system and program interdependencies, which help to expose gaps and requirements.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>		0.373	0.075	-
<p><b>Title:</b> 24) SSA</p> <p><b>Description:</b> Enterprise Support and Services</p> <p><b>FY 2020 Plans:</b> Provide technical expertise in managing information-related risks in enterprise architectures, acquisition strategies, testing and evaluation, and in achieving cybersecurity certification and accreditation. SSA cybersecurity SMEs assist with the development of cybersecurity strategies, project plans and required documentation.</p> <p><b>FY 2021 Plans:</b> Support the CBRND enterprise through continuous engagement to assist with the development of acquisition products during the Engineering and Manufacturing Development and Low Rate Initial Production (EMD/LRIP) phase to reduce risk; assist with</p>		0.257	0.221	2.888

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>technology transitions, and logistics; plan and execute new equipment training, and program management. Provide subject matter expertise in the areas of software development, network architecture, cybersecurity, technology transition, and information assurance standards and policies.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. In FY21, bullets with similar activities spanning multiple fiscal years were consolidated.</p>			
<p><b>Title:</b> 25) SSA</p> <p><b>Description:</b> Chemical, Biological, Radiological, Nuclear (CBRN) Data Model</p> <p><b>FY 2020 Plans:</b> Assist programs and vendors in interpreting and implementing the CCSI standard. This XML-based specification enables standardized and repeatable integration and interoperability between CBRN sensors, network, and C2 systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	0.323	0.446	-
<p><b>Title:</b> 26) SSA</p> <p><b>Description:</b> Cybersecurity / Information Assurance</p> <p><b>FY 2020 Plans:</b> Employ Information Systems Security Engineering (Cybersecurity) efforts to develop or modify the 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>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.</p>	0.743	0.442	-
<p><b>Title:</b> 27) SSA</p> <p><b>Description:</b> Policy and Standards Repository</p> <p><b>FY 2020 Plans:</b></p>	0.578	0.127	-

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
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. Help programs achieve a mandated net-centric environment by providing enabling tools for data management.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.  <b>Title:</b> 28) SSA  <b>Description:</b> Technology Transition Support  <b>FY 2020 Plans:</b> Provide innovation, management and implementation of science and technology initiatives in support of CBRND systems across the enterprise to improve warfighter capability.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.			
<b>Accomplishments/Planned Programs Subtotals</b>	21.993	21.166	6.019

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• IS7: Information Systems (Op Sys Dev)	14.039	16.111	3.234	-	3.234	3.554	15.381	15.383	16.154	Continuing	Continuing
• G47101: JOINT WARNING & REPORTING NETWORK (JWARN)	0.502	0.442	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.944
• JC0208: JOINT EFFECTS MODEL (JEM)	0.911	0.689	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.600
• JS5230: SOFTWARE SUPPORT ACTIVITY (SSA)	0.094	0.081	0.074	-	0.074	0.070	1.187	1.187	1.247	Continuing	Continuing

**Remarks**

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

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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 (SDD)</i>
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The Global-BSP program is using the SOFCIDS (Special Operations Capabilities Integration and Development System) requirements approach and the JROC's "IT Box" acquisition construct which allows fielding of operational capabilities while continued R&D matures technology required for follow-on versions. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple iterative fielding events in lieu of a single fielding event, and field products to the warfighter utilizing an incremental delivery approach. The Global-BSP will achieve Full Operational Capability, complete resourced capabilities, and commence an orderly transition to sustainment in 2020. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

**CBRN INFORMATION SYSTEMS**

CBRN IS acquisition strategy utilizes a Family-of-Systems (FoS) approach to align multiple capabilities to the CBRN-IS architecture and operational environment. CBRN IS leverages the concepts of CBRN Hazard Awareness and Understanding and DISA Enterprise Services to integrate current CBRN capabilities, and other information and intelligence services, applications, and systems to provide increased situational awareness and decision support to commanders for CBRN defense. The strategy supports the implementation of integrated early warning capabilities by incorporating mature science and technology products and emerging technologies from existing advanced technology demonstrations (ATD) and experimental capability demonstrations (ECD). CBRN IS utilizes the Agile software development process to provide for the spiral development and fielding of modular capability packages.

**JOINT EFFECTS MODEL (JEM)**

The JEM 2 acquisition strategy utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching Milestone B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JEM will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

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

JWARN 2 acquisition utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching MS B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JWARN will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

**SOFTWARE SUPPORT ACTIVITY (SSA)**

Software Support Activity (SSA) is a non-acquisition, service organization that provides professional subject matter expertise support throughout the CBDP Enterprise. These services are provided by government and contract personnel with expertise in software development, network architecture, cybersecurity, technology transitions,

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	IS5 / <i>Information Systems (SDD)</i>

information assurance, and standards and policies compliance, and are provided throughout the lifecycle of programs within the CBDP portfolio. These efforts facilitate the efficient development, transition, fielding, modernization, and sustainment of interoperable and integrated CBRN capabilities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
BSP - SW S - software -Global-BSP software development	FFRDC	Johns Hopkins University - Applied Physics Lab : Laurel, MD	20.700	4.169	Dec 2018	2.797	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN IS - SW S - software - integration with BSP, JEM, JWARN	MIPR	Various : Various	1.878	1.059	Dec 2018	1.025	Dec 2019	1.339	Dec 2020	-		1.339	Continuing	Continuing	0.000
JEM - SW SB -2 - Hazard Prediction Model Development and Integration	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	13.796	1.530	Jan 2019	1.964	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - SW S - Product Dev, Various	Various	Various : Various	0.000	1.315	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- SW S - Soft Dev Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.000	3.100	Dec 2018	5.002	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
SSA - SW S - CBRN Data Model	C/CPAF	Various : Various	8.253	0.781	Feb 2019	0.446	Feb 2020	0.778	Feb 2020	-		0.778	Continuing	Continuing	0.000
<b>Subtotal</b>			44.627	11.954		11.234		2.117		-		2.117	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
CBRN IS - ES S - Support Costs - Cybersecurity and IA updates, architecture documentation	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	1.885	0.565	Dec 2018	0.672	Dec 2019	0.715	Dec 2020	-		0.715	Continuing	Continuing	0.000
JEM - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.242	Dec 2018	0.321	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - ILS C - Training and Logistics Support	Various	Various : Various	0.000	1.604	Apr 2019	1.084	Apr 2020	0.000		-		0.000	Continuing	Continuing	0.000
SSA - ES S - Support Costs	MIPR	Space and Naval Warfare (SPAWAR)	9.604	2.105	Feb 2019	1.149	Feb 2020	2.000	Feb 2021	-		2.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
		Systems Center : San Diego, CA													
<b>Subtotal</b>			11.489	4.516		3.226		2.715		-		2.715	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	3.225	0.636	Dec 2018	0.488	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
BSP - OTE S - Software - MOT&E	MIPR	Various : Various	3.744	0.597	Dec 2018	0.911	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN IS - OTE S - Operational Test - service-specific testing, joint test	MIPR	Various : Various	1.304	0.620	Dec 2018	0.675	Dec 2019	0.786	Dec 2020	-		0.786	Continuing	Continuing	0.000
JEM - Test & Evaluation	MIPR	Various : Various	3.653	0.580	Dec 2018	1.202	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- DTE S - Completed Development Test and Evaluation of JWARN 2 in support of JWARN 2 IOT&E	MIPR	Various : Various	1.505	0.300	Dec 2018	0.567	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2 - OTE S - Multi-service Operational Test and Evaluation of JWARN 2 software	MIPR	Various : Various	3.074	0.625	Dec 2018	0.850	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			16.505	3.358		4.693		0.786		-		0.786	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	2.920	0.793	Dec 2018	0.466	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000





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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 Information Assurance Certification/Acceptance products/services, including compliance testing																												
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																												

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSP - RDP-1	1	2019	4	2020
BSP - CSG BD 9, 10	2	2019	2	2019
BSP - Final Operational Test and Evaluation - RDP 1	3	2020	4	2020
BSP - FOC	4	2020	4	2020
CBRN IS - Product Development	1	2019	4	2025
CBRN IS - Operational Assessments	1	2019	4	2025
CBRN IS - Developmental Test	4	2019	4	2025
CBRN IS - Total Package Fielding	1	2019	4	2022
JEM Increment 2 - RDP 4	3	2019	4	2019
JEM Increment 2 - FD 3	3	2019	3	2019
JEM Increment 2 - FD 4	3	2020	3	2020
JEM Increment 2 - Govt DT / OT / V&V	1	2019	4	2020
JEM Increment 2 - BD 4	1	2019	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2020	4	2020
JWARN Increment 2 - Modernization and Update	1	2020	4	2020
JWARN Increment 2 - Product Development	1	2020	3	2020
SSA - Provide Integration and Test, M&S, VV&A Certification and Accreditation	1	2019	4	2025
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2019	4	2025

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2019	4	2025
SSA - Provide Net-Centric Assessment and assist programs with implementation of policy	1	2019	4	2025
SSA - Develop and provide CBRN Data Model implementation guidance, including reference implementations	1	2019	4	2025
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (SDD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MB5: Medical Biological Defense (SDD)	-	127.933	130.074	86.460	-	86.460	56.868	45.226	68.593	83.282	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 medical countermeasures, development of reagents, assays, diagnostic equipment, biosurveillance and supporting efforts.

Efforts included in this project are:

- (1) Botulinum Monoclonal Antibodies (BOT MAB)
- (2) Chem Bio Incident Preparedness and Response - Advanced Development and Manufacturing (CBIPR - ADM)
- (3) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B)
- (4) Medical Countermeasure Platform Technologies (MCMPT)
- (5) Next Generation Diagnostic System 2 (NGDS 2)
- (6) NGDS 2 Chemical Diagnostic (NGDS 2 CHEMDX)
- (7) NGDS 2 Man Portable Diagnostic System (NGDS 2 MPDS)
- (8) Defense Biological Products Assurance Program (DBPAP)
- (9) Antiviral Therapeutics Program (AV TX)
- (10) Joint Mobile Emerging Disease Intervention Clinical Capability (JMEDICC)
- (11) Botulinum Vaccine (VAC BOT)
- (12) Antiviral Prophylaxis Studies (Congressional Interest Item)
- (13) Plague Vaccine (VAC PLG)
- (14) Special Immunizations Program (VAC SIP)

Initiated by the Medical Countermeasure Platform Technologies (MCMPT), the goal of Botulinum Monoclonal Antibodies (BOT MAB) advanced development effort is to counter exposure to BOT A & B toxins. This capability is complementary to botulinum vaccine and therapeutics and will provide a continuum of protection against botulinum toxins. BoNT Advanced Development and Manufacturing of Antibody Technology (ADAMANT) leverages the advanced platform technology developed within the DoD's Advanced Development Manufacturing (ADM) facility. Efforts will focus on the evaluation of efficacy in pivotal animal studies to satisfy Food and Drug Administration (FDA) requirements for the animal rule, as well as the preparation for and execution of consistency lots to support phase 2/3 clinical trials. A Biologics License Application (BLA) will be submitted to the FDA including all clinical, non-clinical and manufacturing data. The FDA grants licensure to products that are determined to be safe and efficacious.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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 (SDD)</i>
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The capability building effort at the DoD ADM will establish and enhance proven biopharmaceutical and vaccine manufacturing technologies to accelerate the delivery of medical countermeasures as part of a medical integrated layered defense. The return on investment is an increased level of preparedness and responsiveness to counter current and emerging chemical and biological threats. By establishing and enhancing proven enabling technologies, the DoD ADM will accelerate development of MCMs at all stages of development, enhance preparedness for existing threats, and accelerate response to emerging threats. MCMs impacted by these efforts include: Vaccines for Viral Agents, Vaccines for Bacterial Agents and Toxins, Monoclonal antibodies, antibody fragments, and antibody conjugates for therapeutic and prophylactic use across all agent classes, and Adjuvants. Funds to support the state of readiness were previously provided through individual product development and manufacturing funding lines.

The CMDR-B program develops medical countermeasures (MCMs) for Service members for protection against 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 candidate drug was approved by the FDA in Oct 18 for Community Acquired Bacterial Pneumonia (CABP) that was required as part of the acquisition strategy for the antibiotic repurposing program from S&T to advanced development.

MCMPT is establishing enabling technologies and pre positioning platform systems at the DoD's Advanced Development Manufacturing (ADM) facility using standardized discovery, design, manufacturing, and testing processes to reduce the medical countermeasure (MCM) development risks. Efforts will center on leveraging the ADM's facility and developing robust manufacturing processes. MCMPT will leverage platform technologies to streamline and accelerate the MCM delivery to the Force by reducing developmental risk. A subset of these technologies will be adapted to deliver a rapid response capability to novel and emerging threats. Through the Advanced Development and Manufacturing Antibody Technologies (ADAMANT) and Rapid Response platforms, MCMPT will deliver an enduring capability from which future candidates can be manufactured. 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 technology (MCMPT) capability.

The NGDS is a family of systems providing increments of diagnostic capabilities over time that address varied CBR threats across the different echelons of the Combat Health Support System. The mission of the NGDS is to provide 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 improves diagnostic capabilities in deployable and laboratory-based combat health support units. NGDS Increment 1 offers improved operational suitability and affordability over legacy systems by developing FDA cleared BWA and infectious disease IVD assays on an existing commercial diagnostic device with a well established FDA regulatory history and pipeline of commercial non-BWA infectious disease diagnostic tests. NGDS 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. NGDS 2 will provide additional capability for diagnosis of CBR-induced diseases, suitable for use in far forward environments, by developing lightweight, portable, and simple-to-use instruments and test kits. In FY21, NGDS 2 has been broken out into two separate programs; NGDS 2 MPDS Program and NGDS 2 CHEMDX Program. NGDS 2 MPDS will complement NGDS Increment 1 by providing a lightweight, portable, and simple-to-use diagnostic capability to end-users in non-laboratory, far-forward environments. NGDS 2 CHEMDX will provide a lightweight, portable, and simple-to-use diagnostic capability to end-users in non-laboratory, far-forward environments.

The DBPAP 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

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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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 DBPAP will use a systematic approach to the introduction of new materials and information into MCM development. This includes advanced platform technologies within the DoD's ADM facility.

The AV TX will develop and deliver FDA approved antiviral therapeutics for the warfighter. Initial drug product will be developed targeting Ebola Virus Disease with Marburg and Sudan to follow for approval of a PanFilo therapeutic to the warfighter. Development of models to provide a therapeutic for alphavirus are being developed through JSTO Research & Development. Other pathogens on the biological warfare threat lists, including viruses of interest from Filoviridae, Arenaviridae, Bunyaviridae, and Flaviviridae, are targets of future interest. 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 JMEDICC is a collaboration between United States and Ugandan research and outbreak response entities intended to enable clinical trials for filovirus (Ebola and Marburg) therapeutics during an outbreak. The JMEDICC effort provides a platform of advanced supportive care, scientific rigor, laboratory and logistical capacity, mobility, and rapid response to test new therapeutics or MCM in a filovirus outbreak setting. The JMEDICC effort is a project whose resulting capability offers a mechanism to greatly accelerate the development of life-saving products for future outbreaks. The performer received approval of an emergency access protocol for the use of the Remdesivir drug in the country of Uganda. JMEDICC effort was funded by the AV TX Program in FY19.

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 and Plague 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 BLA to the 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 Recombinant Botulinum A/B and Plague vaccine programs are no longer seeking FDA licensure.

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

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) Botulinum Monoclonal Antibodies (BOT MAB)	-	-	21.211
<b>Description:</b> Manufacturing			
<b>FY 2021 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Initiate Botulinum monoclonal antibody platform development.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Platform technology transitions from Medical Countermeasure Platform Technologies (MCMPT).				
<b>Title:</b> 2) Chem Bio Incident Preparedness and Response - Adv Dev Mfg (CBIPR - ADM) <b>Description:</b> ADM Infrastructure <b>FY 2020 Plans:</b> Continue activities to maintain the DoD ADM's capabilities in a state of readiness to support Medical Countermeasure (MCM) development and manufacturing. <b>FY 2021 Plans:</b> Continue activities to maintain the DoD ADM's capabilities in a state of readiness to support Medical Countermeasure (MCM) development and manufacturing. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.		-	10.000	10.157
<b>Title:</b> 3) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B) <b>Description:</b> Animal Efficacy Studies. <b>FY 2020 Plans:</b> Execute advanced development contract for mature drug products. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.		-	8.385	-
<b>Title:</b> 4) Medical Countermeasure Platform Technologies (MCMPT) <b>Description:</b> Advanced Development and Manufacturing Antibody Technologies (ADAMANT) BOT A/B <b>FY 2020 Plans:</b> Complete establishment phase of the ADAMANT platform capability. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>		4.702	0.199	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred to another funding line. Platform technology transitions to BOT MAB.				
<b>Title:</b> 5) Next Generation Diagnostic System 2 (NGDS 2)		13.108	10.368	-
<b>Description:</b> Man Portable Diagnostic System (MPDS)				
<b>FY 2020 Plans:</b> Continue Engineering & Manufacturing Development, conduct test activities and initiate clinical trials for MPDS.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. NGDS 2 MPDS funding was split out from the NGDS 2 funding line in FY21.				
<b>Title:</b> 6) NGDS 2		-	2.697	-
<b>Description:</b> Chemical Diagnostic (CHEMDX)				
<b>FY 2020 Plans:</b> Begin Engineering & Manufacturing Development for the Chemical Diagnostic (CHEMDX).				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. NGDS 2 CHEMDX funding was split out from the NGDS 2 funding line in FY21.				
<b>Title:</b> 7) NGDS 2 Chemical Diagnostic (NGDS 2 CHEMDX)		-	-	2.089
<b>Description:</b> Chemical Diagnostic System (CHEMDX)				
<b>FY 2021 Plans:</b> Begin Engineering & Manufacturing Development for the Chemical Diagnostic System.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Program/project funding transferred from NGDS 2.				
<b>Title:</b> 8) NGDS 2 Man Portable Diagnostic System (NGDS 2 MPDS)		-	-	20.283
<b>Description:</b> Man Portable Diagnostic System (MPDS) Product Development				
<b>FY 2021 Plans:</b> Conduct Hardware, software and assay development; system integration, and two clinical trials.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred from another funding line. Program/project funding transferred from NGDS 2.				
<p><b>Title:</b> 9) NGDS 2 MPDS</p> <p><b>Description:</b> Man Portable Diagnostic System (MPDS) Program Management and Support</p> <p><b>FY 2021 Plans:</b> Conduct program management, developmental testing, and operational assessments.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Program/project funding transferred from NGDS 2.</p>		-	-	9.141
<p><b>Title:</b> 10) Defense Biological Products Assurance Program (DBPAP)</p> <p><b>Description:</b> Development</p> <p><b>FY 2020 Plans:</b> Continue development/expansion of biological threat agents reference materials to known and emerging threats. Continue development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continue QA/QC testing to encompass the transition and fielding of biological detection assays. 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. Continue development of prototypes/information for strains contained in Unified Culture Collection.</p> <p><b>FY 2021 Plans:</b> Continue development/expansion of biological threat agents reference materials to known and emerging threats. Continue development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continue QA/QC testing to encompass the transition and fielding of biological detection assays. 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. Continue development of prototypes/information for strains contained in Unified Culture Collection. Supports establishment of a Common Reference Repository - a single source for well-characterized, traceable test articles and vital information for biological defense, effective verification of proficiency testing, improved acquisition of emerging technologies, all at a decreased cost for the individual organizations.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to accelerated development effort.</p>		7.699	6.712	8.872
<p><b>Title:</b> 11) Antiviral Therapeutics Program (AV TX)</p> <p><b>Description:</b> Enabling Technologies</p>		7.447	7.095	11.831

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Non-clinical: Continue efficacy studies with Non-Human Primates infected with Ebola virus.</p> <p><b>FY 2021 Plans:</b> Complete efficacy studies with Non-Human Primates infected with Ebola virus. Start efficacy studies with Non-Human Primates infected with Marburg virus.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to accelerated development effort.</p>				
<p><b>Title:</b> 12) AV TX - JMEDICC</p> <p><b>Description:</b> Enabling Technologies</p>		1.987	-	-
<p><b>Title:</b> 13) Joint Mobile Emerging Disease Intervention Clinical Capability (JMEDICC)</p> <p><b>Description:</b> Enabling Technologies</p> <p><b>FY 2020 Plans:</b> Continue &amp; complete readiness activities for OCONUS clinical capabilities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		-	3.398	-
<p><b>Title:</b> 14) VAC BOT - Recombinant Botulinum Vaccine</p> <p><b>Description:</b> Manufacturing</p> <p><b>FY 2020 Plans:</b> Activities to terminate pursuit of Food and Drug Administration (FDA) licensure.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		29.758	18.500	-
<p><b>Title:</b> 15) VAC BOT - Recombinant Botulinum Vaccine</p> <p><b>Description:</b> Non Clinical and Clinical</p> <p><b>FY 2020 Plans:</b></p>		4.891	21.999	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Activities to terminate pursuit of FDA licensure.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<b>Title:</b> 16) Cong #230 <b>Description:</b> Antiviral prophylaxis studies.		12.000	11.000	-
<b>FY 2020 Plans:</b> Complete phase 3 clinical trials for extended period of safety.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Congressional Increase.				
<b>Title:</b> 17) VAC PLG <b>Description:</b> Nonclinical and Clinical		26.008	17.149	-
<b>FY 2020 Plans:</b> Activities to terminate pursuit of FDA licensure.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<b>Title:</b> 18) VAC PLG <b>Description:</b> Manufacturing		17.488	9.807	-
<b>FY 2020 Plans:</b> Activities to terminate pursuit of FDA licensure.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<b>Title:</b> 19) VAC SIP <b>Description:</b> Storage, Distribution, Potency Testing		2.845	2.765	2.876

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b><i>FY 2020 Plans:</i></b> Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program.			
<b><i>FY 2021 Plans:</i></b> Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Minor change due to routine program adjustments.			
<b>Accomplishments/Planned Programs Subtotals</b>	127.933	130.074	86.460

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MB7: Medical Biological Defense (Op Sys Dev)	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing
• JM8788: NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)	6.563	4.905	0.970	-	0.970	0.000	0.000	0.000	0.000	0.000	12.438
• JX0005: DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)	0.183	0.173	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.356
• JX0210: DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)	0.975	2.961	2.845	-	2.845	2.760	2.736	2.736	2.736	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

BOTULINUM MONOCLONAL ANTIBODIES (BOT MAB)

The goal of the BOT MABs advanced development effort is to counter exposure to BOT A & B toxins. A contract will be awarded to a prime performer responsible for executing efforts in the EMD phase to focus on the evaluation of efficacy in pivotal animal studies to satisfy FDA requirements for the animal rule, as well as the preparation for, and execution of, consistency lots to support phase 2/3 clinical trials. A Biologics License Application (BLA) will be submitted to the FDA including all non-clinical, clinical and manufacturing data. The FDA grants licensure to products that are determined to be safe and efficacious.

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**CHEM BIO INCIDENT PREPAREDNESS AND RESPONSE - ADM**

A contract was awarded to Ology Bioservices on 20 March 2013 (then Nanotherapeutics, Inc.) to establish a Department of Defense (DoD) ADM Facility to rapidly develop, approve (through FDA approval), and manufacture MCMs. The contract was structured to be executed in two (2) phases:

Phase 1-Establish, commission and validate (facility(ies)/ equipment) for two (2) advanced development and manufacturing suites that use agile, flexible (single use, disposable), modular and multi-product technologies for MCM advanced development and manufacturing. Both suites must meet Biological Safety Level-3 (BSL-3) standards. Phase 1 was completed on 31 March 2017.

Phase 2-Support and maintain that capability in a state of readiness to support MCM development (under the animal rule as applicable) and manufacturing and assist in training personnel in its use. This includes transition and integration of new technologies, from Pre-Investigational New Drug Application phase with readiness to support simultaneous operations, through FDA licensure. The first sustainment option (POP 2 years) was completed in 2QFY19; the subsequent sustainment option began thereafter and is scheduled for completion in 4QFY20, but can be extended until 2QFY21 if needed.

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

The CMDR-B program develops MCMs for Service members for protection against 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 candidate is a transitional product from S&T that showed efficacy against plague, anthrax, and other BW agents. The regulatory approach of the program is to pursue development of products to FDA approval under the Animal Rule. The program will conduct non-human primate studies to confirm efficacy. The performer will develop and submit an IFC package to FDA for emergency use to support the warfighter preparedness against MDR. The performer will submit Supplemental New Drug Application for the therapeutic during the EMD Phase. In FY18 PK study on non-human primates was completed for the plague indication and results were analyzed against threat indication. Continued coordination with FDA for supplemental indication of anthrax based on threat level to the warfighter. In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities.

**MCM PLATFORM TECHNOLOGIES (MCMPT)**

The goal of the MCMPT is to rapidly counter a broad-spectrum of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. 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. A subset of these technologies will be adapted to deliver a rapid response capability to novel and emerging threats. Once established, future programs will be able to leverage these platforms for the development of future medical countermeasures. It is anticipated that these efforts will leverage the Other Transactions Authority (OTA) through the medical OTA consortium.

**NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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The NGDS 1 program was a MS A to MS C - acquisition strategy, with MS C approval granted in Dec 2016 for limited production and fielding. NGDS 1 is replacing the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17. NGDS 1 Full Rate Production was approved in Aug 2018.

NGDS 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 continued the technology maturation and risk reduction of a man-portable diagnostic capability in FY18 and transitioned to engineering and manufacturing development phase in FY19. NGDS 2 initiated prototyping of a chemical diagnostic capability in FY18. Separate decisions will be utilized to proceed with further development and production for each capability, based on individual determinations of technology maturity to meet user requirements. Development efforts are cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings. NGDS 2 is broken out into NGDS 2 CHEMDx and NGDS 2 MPDS starting in FY21.

**NEXT GEN DIAG 2 CHEMICAL DIAGNOSTICS (NGDS 2 CHEMDX)**

NGDS Increment 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 CHEMDX will provide a lightweight, portable, and simple-to-use diagnostic capability against chemical threat agents to end-users in non-laboratory, far-forward environments. NGDS 2 CHEMDX initiated prototyping in FY18 and will conclude prototyping in FY21. NGDS 2 CHEMDX is using an Other Transactions Authority (OTA) agreement to take advantage of nontraditional Defense contractor offerings. NGDS 2 CHEMDX program is broken out from the NGDS Increment 2 program starting in FY21.

**NEXT GEN DIAG 2 MAN PORTABLE DIAGNOSTIC SYSTEM (NGDS 2 MPDS)**

NGDS Increment 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 Man Portable Diagnostic System (MPDS) will complement NGDS Increment 1 by providing a lightweight, portable, and simple-to-use diagnostic capability to end-users in non-laboratory, far-forward environments. NGDS 2 MPDS concluded prototyping in FY19 and is continuing with engineering and manufacturing development. MPDS is using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings. The NGDS 2 MPDS program is broken out from the NGDS Increment 2 program starting in FY21.

**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) as well as 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.

**ANTI-VIRAL THERAPEUTICS (AV TX)**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
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The Anti-viral Therapeutics program acquisition strategy supports the development of multiple therapeutics through the Engineering, Manufacturing and Development (EMD) phase against the Ebola (Zaire), Marburg and Sudan bio warfare threats. The initial therapeutic candidate is for the Ebola Zaire that completed a Milestone B decision review in 2QFY19. The overall regulatory approach of the program remains to pursue development of products to FDA approval under the Animal Rule that was approved as the path, by the FDA in 1QFY19. The program completed a Natural History study as well as a dose ranging study that are part of the pivotal animal studies for FDA approval planned. There are 3 more pivotal animal studies for FDA approval. The acquisition strategy for Marburg and Sudan indications will have the performer submitting amended New Drug applications for the therapeutics during the Engineering, Manufacturing and Development (EMD) phase.

**JOINT MOBILE EMERGING DISEASE INTERVENTION CLINICAL CAPABILITY (JMEDICC)**

The Joint Mobile Emerging Disease Intervention Clinical Capability (JMEDICC) is a collaboration between United States and Ugandan research and outbreak response entities. It currently is a joint effort with The United States Army Medical Research Institute of Infectious Diseases (USAMRIID) and The Naval Medical Research Center (NMRC) to enable clinical trials for filovirus (i.e., Ebola and Marburg) therapeutics during an outbreak. JMEDICC effort was funded by the Antiviral Therapeutics (AV TX) Program (MB5) in FY19. A new funding line was added in FY20 to support this effort. The JMEDICC effort is currently focused on filovirus, but is an adaptable capability that can incorporate multiple different medical countermeasures (MCM) in parallel and accommodate multiple site activities. This will maximize JMEDICC's current response capability and infrastructure by expanding as the endemic situation warrants. A cost sharing plan is currently being explored with other government and nongovernment agencies to determine interest and relevance levels. In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities.

**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 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. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

**CONGRESSIONAL INTEREST ITEMS**

**CONGRESSIONAL INTEREST ITEM #230**

Assay development and validation for monkeypox performed in FY19 that informs approval from the FDA for post-exposure prophylaxis (PEP) indication for smallpox. Antiviral prophylaxis studies are being performed. Contract awarded to performer to complete animal rule studies for FDA approval.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

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. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

SPECIAL IMMUNIZATION PROGRAM (VAC SIP)

The SIP effort continually manages, updates, and executes the INDs of selected prophylaxis, treatments and diagnostics development products which provide additional protection to individuals that are at high risk of exposure to CBRN agents. Efforts span Good Manufacturing Practices (GMP), Good Laboratory Practices guidelines necessary to conduct storage and periodic potency testing, as well as clinical administration or products in accordance with the FDA regulated Investigational New Drug (IND) requirements. This Department of Defense program supports the Federal interagency with this effort, as well as academic and industry partners.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CMDR-B - Advanced Development Contract	C/CPIF	TBD : N/A	0.000	0.000		5.439	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - HW S - ADAMANT BOT A/B establishment	C/CPFF	Ology : Alachua, FL	9.573	3.930	Jan 2019	0.175	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - Man Portable Diagnostic System	C/CPFF	Cepheid : Sunnyvale, CA	7.165	10.951	Nov 2018	6.662	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - Chemical Diagnostic (CHEMDX)	C/CPFF	MRIGlobal : Palm Bay, FL	0.000	0.000		1.076	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - Man Portable Diagnostic System #2	C/CPFF	MRIGlobal : Palm Bay, FL	10.679	0.500	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Chemical Diagnostic System (CHEMDX)	C/CPFF	MRIGlobal : Palm Bay, FL	0.000	0.000		0.000		0.774	Dec 2020	-		0.774	Continuing	Continuing	0.000
NGDS 2 CHEMDX - HW C - Develop and mature Assays for Chemical Agent Diagnostics	MIPR	US Army Medical Research Institute of Chemical Defense : Fort Detrick, MD	0.000	0.000		0.000		0.034	Dec 2020	-		0.034	Continuing	Continuing	0.000
NGDS 2 MPDS - HW C - Man Portable Diagnostic System (MPDS)	C/CPFF	Cepheid : Sunnyvale, CA	0.000	0.000		0.000		20.258	Dec 2020	-		20.258	Continuing	Continuing	0.000
DBPAP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : Various	1.826	1.662	Jun 2019	1.400	Mar 2020	1.873	Mar 2021	-		1.873	Continuing	Continuing	0.000
AV TX - Joint Mobile Emerging Disease Intervention OCONUS Clinical Capability (JMEDICC)	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.804	0.539	Jan 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
AV TX - Joint Mobile Emerging Disease Intervention OCONUS Clinical Capability (JMEDICC) - OTA	C/FP	Henry M. Jackson Foundation for the Advancement of Military Medicine : Bethesda, MD	0.000	1.448	Jun 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Clinical Trials - OTA (Ebola)	C/FP	Gilead Sciences : San Francisco, CA	0.000	7.433	Jan 2019	4.946	Nov 2019	6.561	Nov 2020	-		6.561	Continuing	Continuing	0.000
JMEDICC - Clinical Trial Conduct Support	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	0.000		0.500	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
JMEDICC - OCONUS Clinical Capabilities - OTA	C/FP	Henry M. Jackson Foundation for the Advancement of Military Medicine : Bethesda, MD	0.000	0.000		2.115	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC BOT - Manufacturing, Validation and Consistency Lot Production	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	71.218	26.684	Dec 2018	30.394	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CONG - Clinical Trials - OTA	C/FP	SIGA Technologies : Inc., New York, NY	2.213	10.754	Jul 2019	9.857	Jul 2020	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	30.671	26.181	Nov 2018	17.549	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - HW S - - Manufacturing Validation	MIPR	Battelle Memorial Institute : Columbus, OH	2.770	0.890	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			136.919	90.972		80.113		29.500		-		29.500	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CBIPR-ADM - Infrastructure	C/CPFF	Ology : Alachua, FL	0.000	0.000		8.383	Dec 2019	9.225	Dec 2020	-		9.225	Continuing	Continuing	0.000
NGDS - ES C - Studies and WIPT Support	C/CPFF	John Hopkins University : Laurel, MD	0.000	0.145	Aug 2019	0.302	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - ES C - Select Biological Threat Agent Reference Material Support	MIPR	Various : Various	1.620	1.920	Jun 2019	1.500	Mar 2020	1.911	Mar 2021	-		1.911	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	1.580	1.361	Jun 2019	1.482	Mar 2020	1.927	Mar 2021	-		1.927	Continuing	Continuing	0.000
VAC BOT - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	33.198	5.136	Dec 2018	1.310	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC SIP - Storage and Distribution of Vaccines	SS/FP	Fisher BioServices : Rockville, MD	1.790	0.437	Feb 2019	0.453	Jan 2020	0.469	Jan 2021	-		0.469	Continuing	Continuing	0.000
<b>Subtotal</b>			38.188	8.999		13.430		13.532		-		13.532	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
BOT MAB - DTE C - BOT MONO	C/CPFF	TBD : N/A	0.000	0.000		0.000		15.132	Dec 2020	-		15.132	Continuing	Continuing	0.000
NGDS - OTHT C - Test and evaluate interagency	MIPR	Various : Various	0.360	0.020	Aug 2019	0.500	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - DTE C - Virus Strain Production & Testing	MIPR	Various : Various	0.432	0.417	Nov 2018	0.500	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
NGDS 2 CHEMDX - DTE S - Chemical Diagnostic (CHEMDX) Testing	MIPR	Various : Various	0.000	0.000		0.000		0.400	Dec 2020	-		0.400	Continuing	Continuing	0.000
NGDS 2 MPDS - OTHT S - BSL4 Testing	MIPR	Various : Various	0.000	0.000		0.000		0.365	Dec 2020	-		0.365	Continuing	Continuing	0.000
NGDS 2 MPDS - DTE S - MPDS System Test & Evaluation	MIPR	Various : Various	0.000	0.000		0.000		0.889	Dec 2020	-		0.889	Continuing	Continuing	0.000
VAC BOT - DTE C - Nonclinical Studies	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	81.485	1.000	Dec 2018	8.795	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC BOT - DTE C - Battelle	Allot	Battelle Memorial Institute : Columbus, OH	0.900	1.480	Dec 2018	0.000		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	91.814	3.920	Dec 2018	9.407	Dec 2019	0.000		-		0.000	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	12.103	2.118	Dec 2018	2.170	Jan 2020	2.081	Jan 2021	-		2.081	Continuing	Continuing	0.000
<b>Subtotal</b>			187.094	8.955		21.372		18.867		-		18.867	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
BOT MAB - PM/MS C - BOT MONO	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		2.409	Dec 2020	-		2.409	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
BOT MAB - PM/MS C - BOT MONO #2	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		1.468	Dec 2020	-		1.468	Continuing	Continuing	0.000
BOT MAB - PM/MS C - JpDM Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		2.202	Dec 2020	-		2.202	Continuing	Continuing	0.000
CBIPR-ADM - PM/MS C - Program Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.000	0.000		0.917	Dec 2019	0.932	Dec 2020	-		0.932	Continuing	Continuing	0.000
CBIPR-ADM - PM/MS C - Program Management Support #2	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.700	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Program Management (Biological Therapeutics)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		1.055	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS S - Program Management (OPETS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		1.891	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - PM/MS C - Program Management	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.273	Dec 2018	0.024	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - PM/MS C - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	0.499	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 C - Program Management (Dx) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.230	Nov 2018	0.329	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS S - Program Management (JPEO) Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	8.885	0.000	Dec 2018	0.947	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS S - Program Management (Dx) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.006	0.845	Nov 2018	1.887	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS SB - Product Management Systems Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.436	0.000		0.862	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.186	Dec 2020	-		0.186	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		0.199	Dec 2020	-		0.199	Continuing	Continuing	0.000
NGDS 2 CHEMDX - PM/MS S - Program Management (CHEMDX)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.496	Dec 2020	-		0.496	Continuing	Continuing	0.000
NGDS 2 MPDS - PM/MS S - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM)	0.000	0.000		0.000		2.061	Dec 2020	-		2.061	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
		MCS) : Fort Detrick, MD													
NGDS 2 MPDS - PM/MS S - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		2.700	Dec 2020	-		2.700	Continuing	Continuing	0.000
NGDS 2 MPDS - PM/MS S - Program Management (MPDS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		1.121	Dec 2020	-		1.121	Continuing	Continuing	0.000
NGDS 2 MPDS - PM/MS S - Product Management Support	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.486	Dec 2020	-		0.486	Continuing	Continuing	0.000
NGDS 2 MPDS - PM/MS S - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.000		1.544	Dec 2020	-		1.544	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Contractor Support	SS/FFP	Various : Various	1.123	0.849	Feb 2019	0.860	Feb 2020	1.075	Feb 2021	-		1.075	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Support	Allot	JPM Guardian : Aberdeen Proving Ground, MD	2.621	1.907	Jan 2019	1.470	Jan 2020	2.086	Jan 2020	-		2.086	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	8.983	0.000		0.514	Jan 2020	0.974	Jan 2021	-		0.974	Continuing	Continuing	0.000
AV TX - PM/MS S - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.000		2.035	Jan 2021	-		2.035	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
AV TX - PM/MS - SB - Management Support (Biological Therapeutics)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.804	0.014	Dec 2018	0.468	Jan 2020	0.991	Jan 2021	-		0.991	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.304	0.000		0.395	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Management Support (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	3.438	0.000		0.772	Jan 2020	1.270	Jan 2021	-		1.270	Continuing	Continuing	0.000
JMEDICC - PM/MS SB - Program Management (Biological Therapeutics)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.224	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
JMEDICC - PM/MS S - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.370	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
JMEDICC - PM/MS SB - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.189	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
VAC BOT - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.349	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
CONG - PM/MS SB - Program Management (Biological Therapeutics)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.220	Dec 2018	0.202	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
CONG - PM/MS S - Program Management (OPETS)	C/FFP	Various : Various	0.000	1.026	Nov 2018	0.941	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	25.786	1.547	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - Program Management (JPEO) Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	42.933	4.417	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - ADMC Sustainment	C/CPFF	Ology : Alachua, FL	1.800	6.541	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC SIP - PM/MS C - Program Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	2.746	0.290	Mar 2019	0.142	Mar 2020	0.326	Mar 2021	-		0.326	Continuing	Continuing	0.000
<b>Subtotal</b>			107.865	19.007		15.159		24.561		-		24.561	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	470.066	127.933	130.074	86.460	-	86.460	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
BOT MAB - Platform development																												
CBIPR-ADM - MCM Enabling Manufacturing Technologies																												
CBIPR-ADM - MCM Development and Manufacturing Support																												
CMDR-B - Pharmacokinetic Studies																												
CMDR-B - Bacterial Therapeutics Core Program Evaluation of BAXDELA																												
CMDR-B - Animal Efficacy Studies																												
MCMPT - ADAMANT																												
NGDS Increment 2 - Man Portable Dx System (MPDS) Prototype Development																												
NGDS Increment 2 - Man Portable Dx System MS B																												
NGDS Increment 2 - Man Portable Dx System EMD																												
NGDS 2 CHEMDX - ChemDx MS B																												
NGDS 2 CHEMDX - ChemDx EMD																												
NGDS 2 CHEMDX - ChemDx MS C																												
NGDS 2 MPDS - Man Portable Dx System (MPDS) Prototype Development																												
NGDS 2 MPDS - Man Portable Dx System MS B																												
NGDS 2 MPDS - Man Portable Dx System EMD																												
NGDS 2 MPDS - Man Portable Dx System (MPDS) MS C / LRIP																												



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)</i>
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
CONG - Phase 3 Clinical Trial																												
VAC PLG - Manufacturing, Testing Efforts/ Regulatory																												
VAC PLG - Activities to terminate pursuit of FDA licensure																												
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BOT MAB - Platform development	1	2021	4	2025
CBIPR-ADM - MCM Enabling Manufacturing Technologies	1	2020	4	2024
CBIPR-ADM - MCM Development and Manufacturing Support	1	2020	2	2023
CMDR-B - Pharmacokinetic Studies	1	2019	4	2019
CMDR-B - Bacterial Therapeutics Core Program Evaluation of BAXDELA	1	2019	4	2019
CMDR-B - Animal Efficacy Studies	1	2020	4	2020
MCMPT - ADAMANT	1	2019	4	2024
NGDS Increment 2 - Man Portable Dx System (MPDS) Prototype Development	1	2019	4	2019
NGDS Increment 2 - Man Portable Dx System MS B	4	2019	4	2019
NGDS Increment 2 - Man Portable Dx System EMD	4	2019	4	2020
NGDS 2 CHEMDX - ChemDx MS B	2	2021	2	2021
NGDS 2 CHEMDX - ChemDx EMD	2	2021	1	2024
NGDS 2 CHEMDX - ChemDx MS C	1	2024	1	2024
NGDS 2 MPDS - Man Portable Dx System (MPDS) Prototype Development	1	2019	4	2019
NGDS 2 MPDS - Man Portable Dx System MS B	4	2019	4	2019
NGDS 2 MPDS - Man Portable Dx System EMD	4	2019	1	2024
NGDS 2 MPDS - Man Portable Dx System (MPDS) MS C / LRIP	4	2021	4	2021
NGDS 2 MPDS - Man Portable Dx System (MPDS) FRP	1	2024	1	2024
DBPAP - Expand Select Biological Threat Agent Reference Material	1	2019	4	2024
DBPAP - Development and Implementation of Quality Initiatives	1	2019	4	2024
DBPAP - Optimization and Development of Nucleic Acid Assays	1	2019	4	2024
DBPAP - ISO Certification	1	2019	4	2024

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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Events	Start		End	
	Quarter	Year	Quarter	Year
DBPAP - PCR assay validation	1	2019	4	2024
DBPAP - Enabling early warning tools and information exchange	1	2019	4	2024
DBPAP - Surveillance capabilities	1	2019	4	2024
AV TX - Milestone B (Ebola Zaire)	2	2019	2	2019
AV TX - Animal Efficacy Studies (Ebola Zaire)	3	2019	2	2021
AV TX - BLA/NDA Preparation/Submission (Ebola Zaire)	2	2021	4	2021
AV TX - FDA Licensure/Approval (Ebola Zaire)	4	2021	4	2021
AV TX - Milestone C (Ebola Zaire)	1	2022	1	2022
AV TX - OCONUS Clinical Capabilities (JMEDICC)	1	2019	4	2019
JMEDICC - OCONUS Clinical Capabilities	4	2019	4	2020
VAC BOT - Manufacturing, Testing Efforts/Regulatory	1	2019	4	2020
VAC BOT - Activities to terminate pursuit of FDA licensure	3	2020	4	2020
CONG - Animal Efficacy Studies	1	2019	2	2020
CONG - Phase 3 Clinical Trial	4	2019	4	2020
VAC PLG - Manufacturing, Testing Efforts/Regulatory	1	2019	4	2020
VAC PLG - Activities to terminate pursuit of FDA licensure	3	2020	4	2020
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (SDD)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MC5: Medical Chemical Defense (SDD)	-	43.648	60.220	54.392	-	54.392	52.813	31.441	15.215	15.019	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

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. This 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).

Efforts included in this project are:

- (1) Advanced Anticonvulsant System (AAS),
- (2) Alternative Autoinjector Manufacturer Capability (AUTOINJ),
- (3) Bioscavenger (BSCAV-P),
- (4) Improved Nerve Agent Treatment System (INATS),
- (5) Improved Nerve Agent Treatment System Centrally Acting (INATS CA), and
- (6) Rapid Opioid Countermeasure System (ROCS)

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.

AUTOINJ consists of investigating an FDA approved alternative source(s), beyond the single current Department of Defense (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 fielded Antidote Treatment Nerve Agent Auto-injector (ATNAA) product, the oxime (2-PAM) and atropine in a dual chambered autoinjector. This program augments legacy autoinjectors, ATNAA, 2-PAM, and CANA by providing alternative commercial sources which include Dual Drug Delivery Device (D4), the atropine autoinjector, and anti-convulsant autoinjector.

BSCAV-P was intended to be a new capability for use as a prophylaxis against nerve agents. This program is pursuing closeout activities during FY19 and FY20.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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INATS Pre-Breakout advanced development in FY19 and FY20 provides an enhanced capability treatment regimen offering greater protection over a broader spectrum of toxic nerve agent threats. The development includes insertion of a 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).

INATS CA advanced development in FY21 provides a centrally-acting anticholinergic agent to increase survivability and decrease morbidity after exposure to toxic nerve agent threats. Scopolamine was selected for development after an extensive analysis of alternatives and review of data by the Science and Technology community. Added to the currently fielded system, the INATS CA program will improve overall medical outcomes and will be utilized as both a vial for use at definitive care and a stand-alone auto-injector for use in the field.

ROCS is specifically supporting the discovery, characterization, development, and fielding of FDA-approved therapeutic MCMs to protect the Joint Service warfighter against operational exposures to the opioid class of pharmaceutical-based agents (PBAs), a high priority. The first increment of the ROCS program will develop a naloxone autoinjector as a rescue treatment that will counteract the adverse effects from exposure to opioids.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) Advanced Anticonvulsant System (AAS)</p> <p><b>Description:</b> New Drug Application (NDA) Resubmission Activities</p> <p><b>FY 2021 Plans:</b> Continue NDA resubmission activities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to fact of life change in the program/project. The Contractor will need to initiate and complete studies that comply with new Food and Drug Administration (FDA) requirements for manufacturing and quality for autoinjector products.</p>	4.898	-	4.048
<p><b>Title:</b> 2) Alternative Autoinjector Manufacturer Capability (AUTOINJ)</p> <p><b>Description:</b> Manufacturing</p> <p><b>FY 2020 Plans:</b> Complete manufacturing of autoinjector consistency lots; initiate prototype tooling for dual chambered autoinjector; initiate manufacturing, validation for dual chamber auto-injector.</p> <p><b>FY 2021 Plans:</b> Continue prototype tooling.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. No longer doing consistency lots in FY21.</p>	1.000	4.800	2.500
<p><b>Title:</b> 3) AUTOINJ</p>	-	-	1.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Development</p> <p><b>FY 2021 Plans:</b> Continue manufacturing and validation for dual drug chamber autoinjector. Initiate engineering lots for Dual Drug Delivery Device (D4). Initiate manufacturing lots for diazepam.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 4) AUTOINJ</p> <p><b>Description:</b> Testing</p> <p><b>FY 2020 Plans:</b> Complete reliability, continue stability studies for atropine. Initiate functional testing for dual chamber auto injector. Continue prototype development of single autoinjector.</p> <p><b>FY 2021 Plans:</b> Continue stability studies for atropine. Continue functional testing for dual chamber auto injector. Continue prototype development of single autoinjector.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Decrease due to change in program/project technical parameters. No longer doing reliability studies in FY21.</p>	8.194	17.000	9.300
<p><b>Title:</b> 5) AUTOINJ</p> <p><b>Description:</b> FDA Coordination</p> <p><b>FY 2020 Plans:</b> Continue FDA preparation, filing, and meetings for single and dual drug autoinjectors.</p> <p><b>FY 2021 Plans:</b> Continue FDA preparation, filing, and meetings for single and dual drug autoinjectors.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>	0.500	2.068	1.200
<p><b>Title:</b> 6) AUTOINJ</p> <p><b>Description:</b> Clinical</p>	1.000	1.000	0.931

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Continue human factors and environmental testing for single and dual drug autoinjectors.</p> <p><b>FY 2021 Plans:</b> Continue human factors and environmental testing for single and dual drug autoinjectors.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 7) Bioscavenger (BSCAV-P)</p> <p><b>Description:</b> Closeout</p> <p><b>FY 2020 Plans:</b> Complete Program Close Out.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project terminated in FY 2020.</p>	17.669	0.500	-
<p><b>Title:</b> 8) Improved Nerve Agent Treatment System (INATS)</p> <p><b>Description:</b> Manufacturing &amp; Non-Clinical &amp; Clinical- Scopolamine</p> <p><b>FY 2020 Plans:</b> Initiate clinical efforts and continue manufacturing and non-clinical.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. Transferring to INATS CA (MC5).</p>	10.387	21.113	-
<p><b>Title:</b> 9) Improved Nerve Agent Treatment System Centrally Acting (INATS CA)</p> <p><b>Description:</b> Manufacturing/Auto-Injector</p> <p><b>FY 2021 Plans:</b> Continue Auto-Injector Development and Manufacturing Activities</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. INATS-CA was created from the INATS funding line.</p>	-	-	7.100
<p><b>Title:</b> 10) INATS - CA</p>	-	-	19.896

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Non-Clinical</p> <p><b>FY 2021 Plans:</b> Initiate Non-Clinical Animal Studies</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. INATS-CA was created from the INATS funding line.</p>			
<p><b>Title:</b> 11) Rapid Opioid Countermeasure System (ROCS)</p> <p><b>Description:</b> Development</p> <p><b>FY 2020 Plans:</b> Initiate &amp; complete naloxone formulation studies.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Study will complete in FY20.</p>	-	2.304	-
<p><b>Title:</b> 12) Rapid Opioid Countermeasure System (ROCS)</p> <p><b>Description:</b> Manufacturing</p> <p><b>FY 2020 Plans:</b> Initiate manufacturing activities.</p> <p><b>FY 2021 Plans:</b> Continue manufacturing activities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Expecting manufacturing to ramp down in FY21.</p>	-	6.166	4.800
<p><b>Title:</b> 13) Rapid Opioid Countermeasure System (ROCS)</p> <p><b>Description:</b> Clinical Studies</p> <p><b>FY 2020 Plans:</b> Initiate Phase 1 human clinical studies.</p> <p><b>FY 2021 Plans:</b></p>	-	5.269	3.617

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Complete Phase 1 human clinical studies.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Data Analysis & Reports require less funding.			
<b>Accomplishments/Planned Programs Subtotals</b>	43.648	60.220	54.392

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• JM6677: <i>ADVANCED ANTICONVULSANT SYSTEM (AAS)</i>	0.000	3.152	0.000	-	0.000	4.885	8.052	7.862	1.394	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**  
ADVANCED ANTICONVULSANT SYSTEM (AAS)

The Advanced Anticonvulsant System (AAS), consists of Midazolam in an autoinjector for treatment of seizures, to include those caused by nerve agent. 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. The Contractor will need to initiate and complete studies that comply with new FDA requirements for manufacturing and quality for autoinjector products, ultimately leading to FDA approval. Upon FDA approval, sufficient quantities of product to meet Initial Operational Capability (IOC) and Full Operational Capability (FOC) will be purchased. Subsequent purchases for product sustainment will be made by the Defense Logistics Agency. Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The Alternative Autoinjector Manufacturer Capability (AUTOINJ) will identify an alternative source(s) to develop and provide required FDA-approved autoinjector-delivered nerve agent antidote and treatment capabilities to the DoD. Currently, a single DoD source provides all of these capabilities.

The AUTOINJ effort leverages novel technologies and industrial base expansion in order to develop the autoinjector products. AUTOINJ uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current Food and Drug Administration (FDA) regulations. The contractor shall sponsor the drug to the FDA and hold all approvals and/or licenses. Upon FDA approval, purchases for product sustainment will be made by the Defense Logistics Agency.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

AUTOINJ (MC7) Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government.

**BIOSCAVENGER (BSCAV)**

The Bioscavenger program employed a serial evaluation of candidates to achieve competitive prototyping in the Technology Maturation and Risk Reduction (TM&RR) phase, culminating in a down-select decision. The Bioscavenger program then 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 Engineering and Manufacturing Development (EMD) phase, the program continued to meet its performance objectives and produced a current Good Manufacturing Practice (cGMP) drug product for use in further development.

The program will end activities in FY20. In FY19, the program initiated termination of acquisition activities and program close out, will be completed in FY20. The program will continue to work with the Joint Science & Technology Office in their efforts to advance potential candidates and will monitor Health and Human Service programs, international programs, and the commercial sector for potential materiel solutions for this capability gap.

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

The INATS (MC4) program concludes as INATS in FY19.

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 centrally acting formulation development efforts, nonclinical toxicology and efficacy studies and clinical safety studies. In the Engineering and Manufacturing Development (EMD) phase, the Government will engage with commercial partner(s) to ensure that INATS CA development and manufacture is in accordance with Food and Drug Administration (FDA) regulations. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities, resulting in only the INATS CA component being pursued.

The INATS (MC7) line initiates in FY20 and transitions to INATS CA (MC7) in FY21. INATS (MC7) will support the modernization of Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP) using contract actions to extend operational shelf-life and generate data to expand storage temperature conditions.

**IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)**

(MC5) 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 centrally acting formulation development efforts, nonclinical toxicology and efficacy studies and clinical safety studies. In the Engineering and Manufacturing Development (EMD)

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	MC5 / <i>Medical Chemical Defense (SDD)</i>

phase, the Government will engage with commercial partner(s) to ensure that development and manufacture is in accordance with Food and Drug Administration (FDA) regulations.

**RAPID OPIOID COUNTERMEASURE SYSTEM (ROCS)**

Rapid Opioid Countermeasure System (ROCS) is a Joint ACAT III Medical Countermeasure (MCM) Middle Tier acquisition Program of Record (POR) in the Prototype Phase of development. The ROCS program will use existing naloxone autoinjector capabilities identified from focused Market Research. ROCS is a Middle Tier acquisition program. The development of the autoinjector will be conducted under Other Transaction Authority (OTA) agreement. Once FDA approval has been granted the program will transition from Rapid Prototyping to Rapid Fielding or a traditional production and fielding pathway.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
AAS - SW S - NDA Resubmission Activities	C/CPIF	Meridian Medical Technologies Inc. : Columbia, MD	1.630	3.262	Jan 2019	0.000		3.555	Nov 2020	-		3.555	Continuing	Continuing	0.000
AUTOINJ - HW S - Device Inovation	C/FFP	Various : Various	0.000	0.142	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AUTOINJ - HW C - Regulatory Support	C/CPFF	Ology : Alachua, FL	0.000	0.697	Mar 2019	0.000		0.200	Nov 2020	-		0.200	Continuing	Continuing	0.000
AUTOINJ - HW S - Diazepam Autoinjector	C/CPFF	Emergent Biosolutions : Gaithersburg/ Rockville, MD	0.000	0.301	Aug 2019	0.000		3.800	Nov 2020	-		3.800	Continuing	Continuing	0.000
AUTOINJ - HW S - Dual Drug Delivery Device (D4) Prototype Development	C/CPFF	Emergent Biosolutions : Gaithersburg/ Rockville, MD	9.198	4.910	Nov 2018	10.202	Nov 2019	3.987	Nov 2020	-		3.987	Continuing	Continuing	0.000
AUTOINJ - HW S - Autoinjector - Manufacturing of Consistency Lots	C/CPFF	Battelle Memorial Institute : Columbus, OH	3.498	0.523	Dec 2018	8.000	Dec 2019	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	46.682	9.015	Jan 2019	0.500	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Large-Scale Manufacturing	C/CPFF	TBD : N/A	0.000	0.000		3.494	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Animal Efficacy Studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.795	Nov 2018	2.888	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Centrally-Acting Autoinjector Efforts	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		7.639	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Pilot Scale Development of Drug Product	C/CPFF	Battelle Memorial Institute : Columbus, OH	2.842	0.250	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
INATS - HW C - Scopolamine cGMP Efforts and Manufacture of Material	C/CPFF	Various : Various	9.343	2.657	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Reformulation Efforts & Bridging Studies	C/CPFF	Various : Various	4.972	0.225	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS CA - HW C - Manufacturing	C/CPFF	TBD : N/A	0.000	0.000		0.000		7.100	Dec 2020	-		7.100	Continuing	Continuing	0.000
INATS CA - HW C - Non-Clinical	C/CPFF	TBD : N/A	0.000	0.000		0.000		13.650	Nov 2020	-		13.650	Continuing	Continuing	0.000
ROCS - 1. Initiate naloxone formulation studies	C/CPFF	kaleo : Richmond, VA	0.000	0.000		1.860	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
ROCS - 2. Initiate development of autoinjector and large scale manufacturing process	C/CPFF	kaleo : Richmond, VA	0.000	0.000		4.979	Feb 2020	3.000	Dec 2020	-		3.000	Continuing	Continuing	0.000
ROCS - 3. Initiate Human Clinical Studies	C/CPFF	kaleo : Richmond, VA	0.000	0.000		4.255	Aug 2020	2.560	Dec 2020	-		2.560	Continuing	Continuing	0.000
<b>Subtotal</b>			78.165	22.777		43.817		37.852		-		37.852	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
AAS - ES C - Office of Regulated Activities Support (ORA)	MIPR	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	0.000	0.045	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - ES C - Office of Regulated Activities Support (ORA)	MIPR	US Army Medical Materiel Development Activity (USAMMDA) : Fort Detrick, MD	0.000	0.218	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - ILS S - Regulatory Support	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.010	0.923	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - ES C - Office of Regulated Activities Support - (ORA)	MIPR	US Army Medical Research Material Command (USAMRMC) : Fort Detrick, MD	0.000	0.645	Nov 2018	0.713	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			1.010	1.831		0.713		0.000		-		0.000	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 C - Autoinjector Testing	MIPR	US Army Medical Research Material Command (USAMRMC) : Fort Detrick, MD	0.000	0.050	Apr 2019	0.000		0.278	Nov 2020	-		0.278	Continuing	Continuing	0.000
INATS - DTE S - Centrally Acting Phase 2 Trial	C/CPFF	Various : Various	2.240	0.000		2.140	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			2.240	0.050		2.140		0.278		-		0.278	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
AAS - Program Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.727	0.853	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AAS - Program Management (CDP)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.727	0.190	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AAS - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.548	Nov 2018	0.000		0.185	Nov 2020	-		0.185	Continuing	Continuing	0.000
AAS - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.370	0.000		0.000		0.308	Nov 2020	-		0.308	Continuing	Continuing	0.000
AUTOINJ - ADMc Sustainment	C/CPFF	Ology : Alachua, FL	3.661	2.221	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AUTOINJ - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	1.277	1.211	Dec 2018	2.823	Dec 2019	2.823	Dec 2020	-		2.823	Continuing	Continuing	0.000
AUTOINJ - Program Management (MCS) Support	PO	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.594	0.000		1.741	Nov 2019	1.741	Nov 2020	-		1.741	Continuing	Continuing	0.000
AUTOINJ - Program Management (OPETS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.639	Dec 2018	1.598	Nov 2019	1.598	Nov 2020	-		1.598	Continuing	Continuing	0.000
AUTOINJ - Program Management (CDP)	Various	JPM Medical Countermeasure Systems (JPM)	0.000	0.000		0.504	Nov 2019	0.504	Nov 2020	-		0.504	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		MCS) : Fort Detrick, MD													
BSCAV-P - Program Management (CDP)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.655	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - Program Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	6.974	3.966	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - ADMc Sustainment	PO	Ology : Alachua, FL	3.080	0.300	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - Product Management (OPETS)	C/FFP	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	6.989	1.237	Jun 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - Product Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.876	0.242	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	9.001	2.036	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - Product Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.078	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - Product Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM	6.263	2.777	Dec 2018	2.576	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		MCS) : Fort Detrick, MD													
INATS - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	2.970	2.037	Dec 2018	1.663	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
INATS CA - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		2.604	Dec 2020	-		2.604	Continuing	Continuing	0.000
INATS CA - Program Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		1.606	Dec 2020	-		1.606	Continuing	Continuing	0.000
INATS CA - Program Management (CDP)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.549	Dec 2020	-		0.549	Continuing	Continuing	0.000
INATS CA - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.000		1.487	Dec 2020	-		1.487	Continuing	Continuing	0.000
ROCS - Program Management (Chem Defense Pharm)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.175	Dec 2020	-		0.175	Continuing	Continuing	0.000
ROCS - Program Management (OPETS)	C/FFP	Various : Various	0.000	0.000		0.000		0.161	Dec 2020	-		0.161	Continuing	Continuing	0.000
ROCS - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.996	Nov 2019	1.559	Dec 2020	-		1.559	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)</i>
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<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
ROCS - Program Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.907	Nov 2019	0.962	Dec 2020	-		0.962	Continuing	Continuing	0.000
ROCS - ADMc Sustainment	C/CPFF	Ology : Alachua, FL	0.000	0.000		0.742	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			46.509	18.990		13.550		16.262		-		16.262	Continuing	Continuing	N/A
<b>Project Cost Totals</b>			127.924	43.648		60.220		54.392		-		54.392	Continuing	Continuing	N/A

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BSCAV - Program Close Out Activities	2	2019	4	2020
AAS - NDA Resubmission Activities	1	2019	3	2022
AUTOINJ - Manufacturing of Consistency Lots	1	2019	4	2022
AUTOINJ - Prototyping and Testing	1	2019	1	2024
AUTOINJ - FDA Coordination	1	2019	1	2024
AUTOINJ - Clinical	1	2019	3	2022
AUTOINJ - Development	1	2020	1	2022
INATS - Manufacturing (CA)	1	2019	4	2020
INATS - Milestone B (CA)	3	2020	3	2020
INATS - Non Clinical Studies (CA)	2	2019	4	2020
INATS - Clinical Trials (CA)	1	2020	4	2020
INATS CA - Manufacturing/Auto-Injector	1	2021	4	2024
INATS CA - Non-Clinical	3	2021	4	2023
INATS CA - Clinical	1	2021	2	2021
ROCS - Naloxone Formulation Studies	4	2019	1	2020
ROCS - Manufacturing Activities	1	2020	4	2020
ROCS - Human Clinical Studies	3	2020	2	2021
ROCS - FDA	3	2021	4	2022

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (SDD)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
TE5: Test & Evaluation (SDD)	-	8.792	7.684	6.352	-	6.352	5.878	5.879	5.879	6.371	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

Chemical Biological Material Assessment Infrastructure (CBMAI) addresses test infrastructure needs with improvements, modifications, and/or new critical test capabilities for chemical, biological, and emerging threat products across the CBDP. The CBMAI funding (BA4-5) is required to provide existing and future test fixtures and methodology to support advanced development test and evaluation intended to meet a changing threat regardless of the test site/location. These activities support current PoRs (e.g., UIPE FoS, NBCRV SSU, etc.) as well as future PoRs such as interdependent contamination mitigation (C3PO, WADS, SEDS), future protective mask programs (i.e., M50 Tech Refresh), remote detection (air to ground/C-SIRP) and integrated early warning (IEW).

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) CBMAI</p> <p><b>Description:</b> Government Integrated Product Team program management and IPT Support to all CBDP programs and external partners.</p> <p><b>FY 2020 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2021 Plans:</b> Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being or restructured.</p>	1.014	2.940	1.350
<p><b>Title:</b> 2) CBMAI</p> <p><b>Description:</b> CBMAI provides test infrastructure modification build and integration to address detection, protection, and decontamination requirements and milestone schedules. Provide analysis and testing of innovative technologies and rapid prototyping of equipment to expedite the infrastructure development process. Execution of infrastructure modifications and modernization efforts allow test facilities to expand productivity and reduce costs while providing critical test data.</p> <p><b>FY 2020 Plans:</b></p>	7.778	4.744	5.002

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Complete validation and accreditation of aerosol biological agent chamber. Complete integration of upgraded data management system and transition to Dugway. Initiate infrastructure upgrades to address additional PBAs and emerging threat.			
<b><i>FY 2021 Plans:</i></b> Complete the integration and validation of a data management system to allow the test community and users to easily change and configure equipment and securely share test data on outdoor test ranges. Continue the integration and validation of referee equipment to provide accurate protective ensemble performance data. Initiate additional upgrades to JABT, ASC, Staging Facility. Complete validation and accreditation of aerosol biological agent chamber.			
<b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Minor change due to routine program adjustments.			
<b>Accomplishments/Planned Programs Subtotals</b>	8.792	7.684	6.352

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• TE7: Test & Evaluation (Op Sys Dev)	6.179	5.403	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.582

**Remarks**

**D. Acquisition Strategy**

CHEMICAL BIOLOGICAL MATERIEL ASSESSMENT INFRASTRUCTURE (CBMAI)

CBMAI 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. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
CBMAI - HW S - Joint Ambient Breeze Tunnel (JABT)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.197	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Test Grid	C/CPFF	Various : Various	0.000	1.504	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Upgrades, V&V, Transition	Various	Various : Various	0.000	0.433	Dec 2018	1.000	Dec 2019	0.253	Dec 2020	-		0.253	Continuing	Continuing	0.000
CBMAI - HW C - JABT, ASC, Staging Facility Upgrades	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.000		1.300	Oct 2020	-		1.300	Continuing	Continuing	0.000
CBMAI - HW S - NTA Defense Test System Fabrication/Installation	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.300	Dec 2018	0.270	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Open Architecture Data Management System (OADMS) Software Modifications	C/CPFF	Various : Various	0.000	2.871	Dec 2018	1.100	Dec 2019	1.200	Dec 2020	-		1.200	Continuing	Continuing	0.000
CBMAI - HW S - Ballistic Gas Chromatograph (GC)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.286	Dec 2018	1.474	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.261	Dec 2018	1.538	Nov 2019	1.590	Dec 2020	-		1.590	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	6.852		5.382		4.343		-		4.343	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
CBMAI - Data Collection from Regression Test #2	MIPR	Army Materiel Systems Analysis	0.000	0.081	Feb 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (SDD)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
		Activity : Aberdeen Proving Ground, MD													
CBMAI - DTE C - SCA-V	MIPR	S3i Engineering : LLC, Silver Spring, MD	0.000	0.103	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - OTH C - JABT Dissemination System Testing	C/CPFF	Various : Various	0.000	0.075	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - OTHT C - Whole System Live Agent Test (WSLAT) Chamber	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.400	Dec 2019	0.500	Dec 2020	-		0.500	Continuing	Continuing	0.000
CBMAI - OTE S - Test Grid Sustainment	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.667	Mar 2019	0.500	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.926		0.900		0.500		-		0.500	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
CBMAI - PM/MS C - Core Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000	Dec 2018	0.150	Dec 2019	0.159	Dec 2020	-		0.159	Continuing	Continuing	0.000
CBMAI - PM/MS S - IPT Support/Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	1.014	Feb 2019	1.252	Dec 2019	1.350	Dec 2020	-		1.350	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	1.014		1.402		1.509		-		1.509	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2021 Chemical and Biological Defense Program								<b>Date:</b> February 2020			
<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 (SDD)				
	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>		
<b>Project Cost Totals</b>	0.000	8.792	7.684	6.352	-	6.352	Continuing	Continuing	N/A		

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (SDD)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CBMAI - NTA Defense Test System(NTADTS) Facility Upgrades for Next Class of Agents	1	2019	3	2019
CBMAI - Joint Ambient Breeze Tunnel(JABT)- Upgrades	1	2019	3	2019
CBMAI - Ballistic GC	1	2019	4	2020
CBMAI - Test Grid	1	2019	4	2020
CBMAI - Open Architecture Data Management System (OADMS) Complete Develop. & Integrate	1	2019	3	2021
CBMAI - JABT, ASC, Staging Facility Upgrades	1	2021	1	2023
CBMAI - Upgrades, V&V, Transitions	1	2019	4	2025

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	104.187	110.363	122.951	-	122.951	122.579	123.789	122.945	121.558	Continuing	Continuing
DT6: <i>Joint Doctrine And Training Support (Mgmt Support)</i>	-	3.589	3.600	3.600	-	3.600	3.600	3.600	3.600	3.600	Continuing	Continuing
DW6: <i>Major Range And Test Facility Base (Mgmt Support)</i>	-	52.658	55.388	61.466	-	61.466	61.974	62.968	61.732	61.524	Continuing	Continuing
LS6: <i>Laboratory Support (Mgmt Support)</i>	-	13.205	13.123	13.078	-	13.078	13.078	13.076	13.074	13.074	Continuing	Continuing
MS6: <i>Management Support (Mgmt Support)</i>	-	34.202	37.252	43.807	-	43.807	42.927	43.145	43.539	42.360	Continuing	Continuing
O49: <i>Joint Concept Development (Mgmt Support)</i>	-	0.533	1.000	1.000	-	1.000	1.000	1.000	1.000	1.000	Continuing	Continuing

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

The projects in this program element (PE) support Joint Doctrine and Training, sustains the technical test capability at West Desert Test Center (WDTC), sustains the core Department of Defense (DoD) Chemical Biological (CB) Science and Technology (S&T) laboratory infrastructure, provides for program and financial management support, and supports the Joint Concepts, Studies, and Analysis program.

Individual projects include:

- Joint Doctrine and Training Support (DT6): 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.

- Major Range and Test Facility Base (MRTFB) (DW6): operating support to WDTC and BioTesting Division (Chemical Biological Center) for the required institutional test operating costs (e.g. institutional civilian and contractor labor; repair and maintenance of test instrumentation, equipment, and facilities; and replacement of test equipment).

- Laboratory Support (LS6): operating support for sustainment and modernization efforts for surety laboratory infrastructure in order 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.

- Management Support (MS6): management support for the DoD Chemical Biological Defense Program (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 (DASD(CBD)).

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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- Joint Concept Development (O49): plan, conduct, evaluate, and report 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.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	102.883	110.363	112.226	-	112.226
Current President's Budget	104.187	110.363	122.951	-	122.951
Total Adjustments	1.304	0.000	10.725	-	10.725
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	3.515	-			
• SBIR/STTR Transfer	-2.209	-			
• Other Adjustments	-0.002	-	10.725	-	10.725

**Change Summary Explanation**

Funding: FY19 (+\$3.515 Million): Reprogrammings to support CBDP Defense Finance and Accounting System transactions and Financial Improvement & Audit Readiness.

FY19 (-\$2.209 Million): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY21 (+\$10.725 Million): The FY21 funding request was reduced during the Defense-Wide Review (DWR) to account for programs being terminated or restructured (-\$1.350 Million); Departmental economic adjustments (-\$0.002 Million); and program increases to support CBDP Enterprise information services and further development of a common analytical platform (+\$4.7 Million), to enhance the West Desert Test Center capabilities for the Multi-Use Outdoor Range and the Chemical and Emerging Threat Agent Test Complexes (+\$5.0 Million), and to provide dedicated oversight and management support functions provided by the Army as Executive Agent (+\$1.0 Million).

Schedule: N/A

Technical: N/A

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (Mgmt Support)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DT6: Joint Doctrine And Training Support (Mgmt Support)	-	3.589	3.600	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 Joint Requirements Office for Chemical, Biological, Radiological and Nuclear Defense (JRO-CBRND) Doctrine, Training, Leader Education & Exercises program directly supports the Joint Service Chemical Biological Defense Program (CBDP); 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. The purpose of this requirement is to provide technical and subject matter expert support in the areas of: related CBRN Defense (CBRND)/Countering Weapons of Mass Destruction (CWMD); Joint and Multi-Service doctrine development; Joint and Service training, leadership development, education, and exercises. 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 CBPD 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.

This program additionally provides support to the National Defense University (NDU) Center for the Study of WMD to support their efforts as the Chairman's focal point for CWMD Joint Professional Military Education. Additionally, this program provides funding in support of NDU's oversight of and the tuition/fees in support of the Office of the Secretary of Defense for Chemical and Biological Defense (OSD(CBD)) Graduate Fellowship Program initiative hosted by Missouri State University.

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) Joint Requirements Office Doctrine and Training (JRO DT)	3.589	3.600	3.600
<b>Description:</b> Supports Joint Doctrine, Training, Leader Development & Education.			
<b>FY 2020 Plans:</b> Continue to support Joint and Multi-service doctrine development. This includes preparation of various Joint publications which then inform Multi-Service Tactics, Techniques, and Procedures (MTTPs). Continue to support Combatant Command (COCOM) scenario development and controller/evaluator training by providing subject matter experts (SMEs) to exercises. Continue to support training efforts at various Joint Senior Leadership schools.			
<b>FY 2021 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Continue to support Joint and Multi-service doctrine development. This includes preparation of various Joint publications which then inform MTTPs. Continue to support COCOM scenario development and controller/evaluator training by providing SMEs to exercises. Continue to support training efforts at various Joint Senior Leadership schools.			
<b>Accomplishments/Planned Programs Subtotals</b>	3.589	3.600	3.600

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (Mgmt Support)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
DW6: Major Range And Test Facility Base (Mgmt Support)	-	52.658	55.388	61.466	-	61.466	61.974	62.968	61.732	61.524	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) and Non Traditional Agent (NTA) 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 BioTesting Division (BTD) of the Chemical and Biological Center (CBC), 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 BTD-CBC in compliance with Section 232 of the National Defense Authorization Act (NDAA) for FY03 (Public Law 107-314 - December 2002).

WDTC and BTD-CBC are the reliance centers 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 in accordance with Program Budget Decision 250 (1996).

WDTC and BTD-CBC 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 are generated to support acquisition decisions of CB defense equipment.

The 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 BTD to CBC 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 Executive Agent Responsible Officer will ensure laboratory directors or the 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 the 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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) BioTesting Division (BTD) - Civilian Labor	3.938	3.364	3.402

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Maintain BTD Chemical and Biological Center (CBC), Major Range and Test Facility Base (MRTFB) technical test capability and operations to include institutional civilian labor costs. Ensure the safe and efficient operations of the MRTFB to include safety, security, resource management, surety operations, range control, environmental oversight, workload management, and training. 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 2021 Plans:</b> Maintain BTD-CBC, MRTFB technical test capability and operations to include institutional civilian labor costs. Ensure the safe and efficient operations of the MRTFB to include safety, security, resource management, surety operations, range control, environmental oversight, workload management, and training. 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 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 2) BTD TEST - Lothar Salomon Test Facility (LSTF) 24-Hour Support</p> <p><b>FY 2020 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 LSTF Complex and the Baker Lab.</p> <p><b>FY 2021 Plans:</b> Provide 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 LSTF Complex and the Baker Lab.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>	0.900	0.598	0.650
<p><b>Title:</b> 3) BTD TEST - Sustainment</p> <p><b>FY 2020 Plans:</b> Provides for ongoing sustainment of existing test instrumentation and equipment at BTD-CBC, 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. Also provides for additional office and laboratory equipment required for the inspection and certification for Building 2029 LSTF Annex.</p> <p><b>FY 2021 Plans:</b></p>	1.412	2.842	2.850

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (Mgmt Support)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Provides for ongoing sustainment of existing test instrumentation and equipment at BTDC-CBC, 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. Funds the ongoing life-cycle replacement of field and laboratory calibrated instrumentation and equipment that has reached the end of its useful life.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>				
<p><b>Title:</b> 4) BTDC TEST - Support</p> <p><b>FY 2020 Plans:</b> Support the BTDC-ECBC defense mission by funding contractor labor overhead costs. Provides contractual efforts to the MRTFB including chemical and biological analysis, field support, planning, and report documentation. Provides the additional support through contractual efforts to support variable workload rates and address capacity shortfalls created by civilian authorization limits.</p> <p><b>FY 2021 Plans:</b> Support the BTDC-CBC defense mission by funding contractor labor overhead costs. Provides contractual efforts to the MRTFB including chemical and biological analysis, field support, planning, and report documentation. Provides the additional support through contractual efforts to support variable workload rates and address capacity shortfalls created by civilian authorization limits.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		0.600	0.758	0.650
<p><b>Title:</b> 5) West Desert Test Center (WDTC), MRTFB</p> <p><b>Description:</b> Civilian Labor</p> <p><b>FY 2020 Plans:</b> Funds will continue to support the overhead costs of the civilian labor for Program Budget Guidance (PBG) authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core Test and Evaluation (T&amp;E) skills as part of the Government civilian workforce.</p> <p><b>FY 2021 Plans:</b></p>		24.659	25.736	26.504

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 (Mgmt Support)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Funds will continue to support the overhead costs of the civilian labor for PBG authorizations. The balance will be customer funded. The test customer will pay all direct costs directly attributable to the use of a test facility or resource for testing of a particular program. Funding will be essential to maintain core T&E skills as part of the Government civilian workforce. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to fact of life change in the program/project. Increase in personal is needed to support mission requirements.				
<b>Title:</b> 6) WDTC, MRTFB <b>Description:</b> Sustainment  <b>FY 2020 Plans:</b> Provide 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. <b>FY 2021 Plans:</b> Provide 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. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to fact of life change in the program/project. Increase in personal is needed to support mission requirements.		5.067	5.615	11.968
<b>Title:</b> 7) WDTC, MRTFB <b>Description:</b> Support Staff  <b>FY 2020 Plans:</b> Provide WDTC with a specially trained support staff to operate and maintain all critical testing systems such as mission related HVAC systems and decontamination systems within WDTC's Material Test Facility (MTF) and Combined Chemical Test Facility (CCTF). <b>FY 2021 Plans:</b> Provide WDTC with a specially trained support staff to operate and maintain all critical testing systems such as mission related HVAC systems and decontamination systems within WDTC's MTF and CCTF.		1.896	1.872	1.872
<b>Title:</b> 8) WDTC, MRTFB <b>Description:</b> Contractor Labor, Overhead - not billable to customers.		13.193	13.570	13.570

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&amp;E personnel. Functions performed include chemical and biological analysis, field support, planning, and report documentation.</p> <p><b>FY 2021 Plans:</b> Funds will continue to support contractor labor costs not billable to the customer. Contract labor will be essential to augment core civilian T&amp;E personnel. Functions performed include chemical and biological analysis, field support, planning, and report documentation.</p>			
<p><b>Title:</b> 9) Non-Traditional Agent (NTA) TEST</p> <p><b>FY 2020 Plans:</b> Maintain synthesis capability of Class 1 NTA compounds and other NTA classes in support of program of record test and evaluation. Continue to develop NTA test methods for protective equipment. Continue to develop chemical dissemination and challenge monitoring methods for other NTA classes.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	0.993	1.033	-
<b>Accomplishments/Planned Programs Subtotals</b>	52.658	55.388	61.466

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (Mgmt Support)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
LS6: Laboratory Support (Mgmt Support)	-	13.205	13.123	13.078	-	13.078	13.078	13.076	13.074	13.074	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 Department of Defense (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) research, development, test, and evaluation (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)**

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Laboratory Infrastructure	11.633	11.140	11.302
<b>Description:</b> Chemical Biological Center (CBC) Surety Facility Sustainment			
<b>FY 2020 Plans:</b> Modernization efforts continue to be directed at 25 year or older surety laboratory infrastructure. FY20 planned efforts include: Phase I upgrade Toxic Exhaust from simplex fans system to fully redundant duplex fan, initiate build phase for the Data Reduction building, and primary chamber and Laboratory Heating and Cooling system replacement and upgrade. Modernization efforts will bring laboratories up to state of the art standards and enable Chemical Biological Defense Program (CBDP) core capabilities. Sustainment efforts provide for gas filter maintenance and change out, and sustainment of critical laboratory systems.			
<b>FY 2021 Plans:</b> Modernization efforts continue to be directed at 25 year or older surety laboratory infrastructure. FY21 planned efforts include: Continued upgrade and modernization efforts for the Data Reduction Building and primary chamber and Laboratory, to include fume hood exhaust systems, heating, ventilation, and air conditioning (HVAC), epoxy floors, fire protection, and security systems. Modernization efforts will bring laboratories up to state of the art standards and enable CBDP core capabilities. Sustainment efforts provide for gas filter maintenance and change out, and sustainment of critical laboratory systems.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.			
<b>Title:</b> 2) Laboratory Infrastructure	1.572	1.983	1.776

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the U.S. Army Medical Research Institute for Chemical Defense (USAMRICD) Infrastructure Support</p> <p><b>FY 2020 Plans:</b> Continues support to laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at USAMRIID and USAMRICD. Activities supported include laboratory support operations, maintenance and repair of existing capabilities, chemical agent security, quality systems compliance, chemical and biological safety, and research protections. Initiate and complete Joint Worldwide Intelligence Communications System (JWICS) access at USAMRICD to establish capability for Top Secret (TS) and TS/Sensitive Compartmented Information (SCI) onsite communication. The SCI Facility (SCIF) will assist with ensuring USAMRICD meets all security regulations and policies related to its chemical defense mission.</p> <p><b>FY 2021 Plans:</b> Continues support to laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at USAMRIID and USAMRICD. Activities supported include laboratory support operations, maintenance and repair of existing capabilities, chemical agent security, quality systems compliance, chemical and biological safety, and research protections. Sustain JWICS TS/SCI onsite communication access at USAMRICD to assist with ensuring USAMRICD meets all security regulations and policies related to its chemical defense mission.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Funding increase supports requirement to increase capability to synchronize Intelligence Community threats with research, training, and operational needs.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	13.205	13.123	13.078

<p><b>C. Other Program Funding Summary (\$ in Millions)</b> N/A</p> <p><b>Remarks</b></p> <p><b>D. Acquisition Strategy</b> N/A</p>
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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 / Management Support (Mgmt Support)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MS6: Management Support (Mgmt Support)	-	34.202	37.252	43.807	-	43.807	42.927	43.145	43.539	42.360	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project provides management support for the Department of Defense (DoD) Chemical and Biological Defense Program (CBDP). It includes program oversight and integration of overall non-Chemical Biological Radiological Nuclear (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 Defense Threat Reduction Agency (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 Chemical Biological Defense (CBD) Annual Report to Congress; and program guidance development by the Program Analysis and Integration Office (PAIO).

Office of the Secretary of Defense (OSD) Biosafety. The Biological Select Agent and Toxins (BSAT) Biorisk Program Office (BBPO) supports the DoD Executive Agent (EA) and Executive Agent Responsible Official (EARO) for BSAT Biosafety and Biosecurity Programs in their responsibilities for mission oversight, technical review, inspection, harmonization of biosafety and biosecurity protocols and procedures across DoD laboratories handling BSAT. A portion of the funding line transitions to BSAT Research Support starting in FY20 to support the Scientific Gaps in Biorisk Research Program (SGBRP) to address gaps in scientific knowledge pertaining to BSAT biosafety and biosecurity. Closing these gaps will reduce the inherent risks associated with BSAT research in CBDP laboratories and supports research and development work on priority agents.

The Joint Acquisition Chemical, Biological, Knowledge System (JACKS) Defense Business System (DBS) provides for management support for software development and application hosting on Non-classified Internet Protocol (IP) Router Network (NIPRNet) and Secret Internet Protocol Router Network (SIPRNet) of the JACKS; and information technology solutions, and business intelligence tools to provide data visualization, reporting, and Commercial off the Shelf (COTS) utilization for the CBRN community. JACKS provides the CBRN community a centralized authoritative and comprehensive source of CBRN products information through a single database interface.

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

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 / Management Support (Mgmt Support)
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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.

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.

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. JSCBIS will transition to the modernized system, the Joint Integrated CBRN Analytic Platform (JICAP). Also included within the project is financial management services to include fund distribution, execution reporting, and fiscal financial statements.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) Office of the Secretary of Defense (OSD) Biosafety (OSD BIOSAFETY)</p> <p><b>Description:</b> Biological Select Agent and Toxins (BSAT) Support</p> <p><b>FY 2020 Plans:</b> The BSAT Biorisk Program Office (BBPO) supports the DoD Executive Agent (EA) and Executive Agent Responsible Official (EARO) for BSAT Biosafety and Biosecurity Programs in their responsibilities for mission oversight, technical review, inspection, harmonization of biosafety and biosecurity protocols and procedures across DoD laboratories handling BSAT. The BBPO FY20 plan is to maintain subject matter expert (SME) program staffing, the newly developed Quality Management System (QMS), the Defense BSAT Business System, as well as, conduct electronic life cycle management of these systems. BBPO will perform laboratory site assistance visits, and conduct observation of laboratory inspections while maintaining oversight of the DoD BSAT inspection program. BBPO will execute regular stakeholders meetings, conduct protocol reviews, and publish guidance from quarterly Biorisk Scientific Review Panel (BSRP) meetings. We will conduct semi-annual Responsible Official (RO) and Biological Safety Officer (BSO) Council meetings. The BBPO will maintain interagency engagements, and fund research through the Scientific Gaps in Biorisk Research Program (SGBRP) to address safety-related scientific knowledge gaps.</p> <p><b>FY 2021 Plans:</b> Continue to maintain the Joint Interagency Biorisk Program System (JIBS) (Defense BSAT Business System), continue to perform laboratory site visits, participate and oversee laboratory inspections, execute stakeholders meetings, BSRP meetings, SGBRP committees, contribute towards harmonization of the biosafety and biosecurity across DoD BSAT registered laboratories.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>	2.085	2.233	2.249
<p><b>Title:</b> 2) BSAT RESEARCH SUPPORT</p>	-	1.051	0.959

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Management Support (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Scientific Gaps in Biorisk Research Program (SGBRP) Support</p> <p><b>FY 2020 Plans:</b> The SGBRP supports research that addresses Biological Select Agent and Toxins (BSAT) biosafety and biosecurity scientific knowledge gaps. Funding will assist in the mitigation of inherent biosafety and biosecurity risks associated with BSAT research executed in Chemical Biological Defense Program (CBDP) laboratories by performing research that closes scientific gaps in biosafety and biosecurity knowledge. Closing these gaps in knowledge will enhance mission capabilities, and support research on priority agents for the Department of Defense (DoD).</p> <p><b>FY 2021 Plans:</b> Continue to support the SGBRP. Conduct two preliminary gap research projects.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 3) Executive Agent (EA) Management</p> <p><b>FY 2021 Plans:</b> Provides support to the DoD EA to conduct coordination and integration of the Research Development Test &amp; Evaluation (RDT&amp;E) and acquisition requirements of the military departments for chemical and biological warfare defense programs of the DoD and review all funding requirements for the Chemical Biological Defense Program as codified in public law and Department of Defense Directive (DODD) 5160.05E.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line.</p>	-	-	1.000
<p><b>Title:</b> 4) Joint Acquisition CB Knowledge System Defense Business System (JACKS DBS)</p> <p><b>Description:</b> CBRN Enterprise Services and Support</p> <p><b>FY 2021 Plans:</b> Support the Joint Program Executive Office for Chemical Biological Radiological and Nuclear Defense (JPEO-CBRND) enterprise and Chemical Biological Radiological Nuclear (CBRN) community of users with accessible CBRN information and defense business systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	-	-	2.798

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 / Management Support (Mgmt Support)		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred from another funding line. Funding line established to increase visibility into defense business system management.				
<p><b>Title:</b> 5) Joint Requirements Office Management (JRO MGT)</p> <p><b>Description:</b> JRO Management Support &amp; Requirements Development</p> <p><b>FY 2020 Plans:</b> Continue to 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. Continue to chair the CWMD Working Group for the Protection Functional Capabilities Board (FCB). Continue to serve as the Joint Staff focal point for CBRN reports, assessments, meetings, agreements, concepts and studies, ATDs, and JCTDs. Continue to lead the CBDP Enterprise POM development. Continue to prepare various JCIDS documents, including AoAs, IS ICDs, CDDs, and CPDs.</p> <p><b>FY 2021 Plans:</b> Continue to 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. Continue to chair the CWMD Working Group for the Protection FCB. Continue to serve as the Joint Staff focal point for CBRN reports, assessments, meetings, agreements, concepts and studies, ATDs, and JCTDs. Continue to lead the CBDP Enterprise POM development. Continue to prepare various JCIDS documents, including AoAs, IS ICDs, CDDs, and CPDs.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		5.961	8.607	8.502
<p><b>Title:</b> 6) Joint Test Infrastructure Working Group (JTIWG)</p> <p><b>FY 2020 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 Director of Operational Test &amp; Evaluation (DOT&amp;E) for OSD T&amp;E Oversight; and support the Nuclear, Chemical, Biological (NCB) in infrastructure planning; input to the POM process; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&amp;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.</p> <p><b>FY 2021 Plans:</b></p>		6.820	6.402	6.708

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Management Support (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>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; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&amp;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.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>			
<p><b>Title:</b> 7) Office of the Secretary of Defense Management (OSD MGT)</p> <p><b>FY 2020 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.</p> <p><b>FY 2021 Plans:</b> Continue performing program reviews/assessments, providing programmatic PPBE oversight/analysis, and providing congressional issue analysis and support. Supporting financial management services provided by DTRA, such as funding distribution and execution reporting.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. CBDP Enterprise audit and Defense Finance and Accounting System (DFAS) support transitions to OSD AUDIT DFAS (Item Management Support (MS6)) starting in FY21.</p>	10.672	11.667	6.932
<p><b>Title:</b> 8) OSD Audit Readiness - Defense Finance Accounting Services (OSD AUDIT DFAS)</p> <p><b>Description:</b> CBDP Audit and DFAS Support</p> <p><b>FY 2021 Plans:</b> Continue to provide the CBDP Enterprise all aspects of accounting; financial statements; reconciliation of budgetary and proprietary accounts, processing of commitments and obligations; financial accounting compliance; funds management and control; management of the Managers' Internal Control Program and financial systems integration and coordination.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	-	-	5.176

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 / Management Support (Mgmt Support)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Program/project funding transferred from another funding line.			
<b>Title:</b> 9) Program Analysis and Integration Office Management (PAIO MGT)	8.664	7.292	9.483
<b>FY 2020 Plans:</b> Continue to develop assessments to support RDA Planning. Continue providing 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. Continue to provide JSCBIS database management in the modernized system.			
<b>FY 2021 Plans:</b> Continue to develop assessments to support RDA Planning. Continue providing 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. Continue to provide JSCBIS database management in the modernized system. Initiate Phase II of development, for the modernized system JICAP.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters. Increase supports Phase II JICAP development.			
<b>Accomplishments/Planned Programs Subtotals</b>	34.202	37.252	43.807

<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A
<b>Remarks</b>
<b>D. Acquisition Strategy</b> N/A

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 Concept Development (Mgmt Support)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
O49: Joint Concept Development (Mgmt Support)	-	0.533	1.000	1.000	-	1.000	1.000	1.000	1.000	1.000	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 Chemical, Biological, Radiological, and Nuclear (CBRN) defense 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 (CONOPS) for employing and developing capabilities; and analyzing specific issues that contribute to Program Objective Memorandum (POM) development.

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

	FY 2019	FY 2020	FY 2021
<b>Title:</b> 1) Joint Concepts, Studies, and Analysis (JCSA)	0.533	1.000	1.000
<b>Description:</b> Support to JCSA			
<b>FY 2020 Plans:</b> Continue to perform Advanced Threat Analysis with several more categories of threat. Continue to update best representative agents for consideration in requirements and testing. Continue to conduct detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. Continue to update detailed operational risk analyses to support CBDP leadership decisions.			
<b>FY 2021 Plans:</b> Continue to perform Advanced Threat Analysis with several more categories of threat. Continue to update best representative agents for consideration in requirements and testing. Continue to conduct detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the FY15 Advanced Threat Studies. Continue to update detailed operational risk analyses to support CBDP leadership decisions.			
<b>Accomplishments/Planned Programs Subtotals</b>	0.533	1.000	1.000

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

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 Concept Development (Mgmt Support)

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

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>							
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	21.269	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.269
SB6: <i>Small Business Innovative Research (SBIR)</i>	-	21.269	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.269

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

The overall objective of the Chemical Biological Defense (CBD) Small Business Innovative Research (SBIR) program is to improve the transition or transfer of innovative chemical and biological defense (CBD) technologies between Department of Defense (DoD) components and the private sector for mutual benefit. The CBD SBIR 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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	21.269	0.000	0.000	-	0.000
Total Adjustments	21.269	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	0.000	-			
• SBIR/STTR Transfer	21.269	-			
• Other Adjustments	0.000	-		-	-

**Change Summary Explanation**

Funding: FY19 (+\$21.269 Million): Funding transferred and applied to Small Business Innovative Research program.

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
SB6: <i>Small Business Innovative Research (SBIR)</i>	-	21.269	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.269
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The Small Business Innovative Research (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, Public Law (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 Department of Defense (DoD) has consolidated management and oversight of the Chemical Biological Defense Program (CBDP) into a single office within the Office of the Secretary of Defense (OSD). The Army was designated as the Executive Agent for coordination and integration of the CBDP. 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 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.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) SBIR/STTR <b>Description:</b> Small Business Innovative Research.	21.269	-	-
<b>Accomplishments/Planned Programs Subtotals</b>	21.269	-	-

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

N/A

**Remarks**

**D. Acquisition Strategy**

N/A

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	41.813	51.834	39.530	-	39.530	42.982	55.883	60.755	72.791	Continuing	Continuing
CA7: <i>Contamination Avoidance (Op Sys Dev)</i>	-	6.115	10.278	15.789	-	15.789	16.921	11.204	11.857	26.209	Continuing	Continuing
CM7: <i>Homeland Defense (Op Sys Dev)</i>	-	1.214	2.286	1.421	-	1.421	1.420	3.335	3.337	1.506	Continuing	Continuing
C07: <i>Collective Protection (Op Sys Dev)</i>	-	3.270	5.755	7.865	-	7.865	8.316	9.563	4.682	2.988	Continuing	Continuing
DE7: <i>Decontamination (Op Sys Dev)</i>	-	0.307	1.442	0.633	-	0.633	0.634	0.634	0.634	0.635	Continuing	Continuing
IP7: <i>Individual Protection (Op Sys Dev)</i>	-	2.087	6.080	6.463	-	6.463	8.447	8.429	8.431	7.533	Continuing	Continuing
IS7: <i>Information Systems (Op Sys Dev)</i>	-	14.039	16.111	3.234	-	3.234	3.554	15.381	15.383	16.154	Continuing	Continuing
MB7: <i>Medical Biological Defense (Op Sys Dev)</i>	-	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing
MC7: <i>Medical Chemical Defense (Op Sys Dev)</i>	-	0.000	1.248	1.817	-	1.817	1.678	5.032	10.456	8.578	Continuing	Continuing
TE7: <i>Test &amp; Evaluation (Op Sys Dev)</i>	-	6.179	5.403	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.582

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

The projects in this program element (PE) support efforts to upgrade systems that have been fielded or have received approval for full rate production in order to maintain Joint Force readiness.

Individual projects include:

- Contamination Avoidance (CA7): technology refresh of fielded analytical laboratory system capabilities to conduct on-site analysis of any unknown sample and test potential life-threatening substances.

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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>	
<p>- Homeland Defense (CM7): technology refresh of fielded analytical laboratory system capabilities to conduct on-site analysis of any unknown sample and test potential life-threatening substances.</p> <p>- Collective Protection (CO7): technology upgrade and refresh of fielded collective protection systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable, enabling mission accomplishment in spaces safe from the effects of chemical, biological, and radiological (CBR) contamination.</p> <p>- Decontamination (DE7): technology refresh of fielded Contamination Mitigation (ConMit) systems that will remove and/or detoxify contaminated material without damaging combat equipment, personnel, or the environment.</p> <p>- Individual Protection (IP7): technology refresh of fielded individual protective equipment which enable the Joint Force to operate in a contaminated CBR environment with little or no degradation to performance.</p> <p>- Information Systems (IS7): technology refresh of fielded information systems that shape the battlespace against CBR threats.</p> <p>- Medical Biological Defense (MB7): technology refresh of fielded medical diagnostic systems and associated capabilities (e.g., assays) that contribute to the layered medical defenses against biological warfare agent threats facing U.S. Forces in the field.</p> <p>- Medical Chemical Defense (MC7): technology upgrade of fielded medical nerve agent treatment system that contribute to the layered medical defenses against chemical warfare agent threats facing U.S. Forces in the field.</p> <p>- Test and Evaluation (TE7): technology upgrades and revitalization of fielded test capabilities and infrastructure at Dugway Proving Ground necessary to evaluate CBRN Defense systems in realistic operating environments.</p> <p>The projects in this PE support operational systems development necessary to maintain operational effectiveness and are therefore correctly placed in Budget Activity 7.</p>		

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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	43.741	54.023	45.999	-	45.999
Current President's Budget	41.813	51.834	39.530	-	39.530
Total Adjustments	-1.928	-2.189	-6.469	-	-6.469
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	0.000	-2.189			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.023	-			
• SBIR/STTR Transfer	-1.904	-			
• Other Adjustments	-0.001	-	-6.469	-	-6.469

**Change Summary Explanation**

Funding: FY19 (-\$0.023 Million): Reprogramming adjustments to balance overall portfolio efforts.

FY19 (-\$1.904 Million) Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (-\$2.189 Million): Congressional Directed Reductions to the Analytical Laboratory System Modification, Modernization Protection Collective Protection, the Joint Biological Agent Identification and Diagnostic System and the Software Support Activity programs.

FY21 (-\$6.469 Million): The FY21 funding request was reduced during the Defense-Wide Review (DWR) to account for programs being terminated or restructured (-\$23.794 Million); Departmental economic adjustments (-\$0.035 Million); and program increases to mitigate obsolescence on fielded systems and upgrade test and evaluation facilities (+\$17.360 Million).

Schedule: N/A

Technical: N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 (Op Sys Dev)		
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CA7: Contamination Avoidance (Op Sys Dev)	-	6.115	10.278	15.789	-	15.789	16.921	11.204	11.857	26.209	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The project supports technology upgrade and refresh of fielded dismounted reconnaissance and detection systems that minimize chemical, biological, and radiological (CBR) contamination and prevent further cross-contamination during operations.

Efforts included in this project are:

- (1) Expeditionary Analytic Modernization (EXANA MOD)
- (2) Chemical Biological Radiological Nuclear (CBRN) Dismounted Reconnaissance Systems (CBRN DRS)
- (3) Joint Chemical Agent Detector (JCAD) Solid Liquid Adapter (SLA)

The EXANA MOD effort supports the evaluation of analytical components for technical refreshment and upgrades of key components of the analytical laboratory systems that have become obsolete, or are no longer being supported by the manufacturer. This allows the Common Analytical Laboratory System (CALs) and Analytical Laboratory System (ALS) Modification (MOD) users to maintain their operational capability and operational effectiveness.

The CBRN DRS provides the technology upgrade and refresh effort for the CBRN DRS system supporting Dismounted Reconnaissance, Surveillance, CBRN Sensitive Site Assessment, and CBRN Sensitive Site Exploitation missions which enables more detailed and near real-time CBRN information flow for the Warfighter. Warfighters will use the portable, commercial and Government off-the-shelf equipment provided to detect, identify, sample, decontaminate, mark, and report CBRN hazards and emerging threats. This technology upgrade and refresh effort for the CBRN DRS addresses and mitigates technology/equipment obsolescence and technology insertion. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs. Starting in FY21, the System Enhancement Package (SEP) effort will identify and test capability to meet updated and new user requirements to support threats and capability gaps in sensitive site exploitation. System enhancement packages will be identified and incorporated into the CBRN DRS as engineering change proposals to the base kit. SEP v1 will provide an Improved Biological Detection Set (IBDS). SEP v2 will provide an Improved Protection and Power Set (IPPS). SEP v3 will provide an Improved Chemical Detection Kit. SEP v4 will provide a kit of situational awareness/decision support enhancements called the CBRN Dismounted Tactical Awareness Kit (CBRN DTAK). CBRN DRS will be produced at government production facilities. The SEP packages will be configured, produced, and fielded in accordance with priorities and needs of the Services.

The JCAD is a miniaturized, rugged, and portable point chemical agent detector that automatically and simultaneously detects, identifies, & alerts the presence of nerve, blister, & blood chemical warfare agents. M4 achieved Full Rate Production (FRP) in Sep 08 and finished in FY10. Milestone Decision Authority (MDA) authorized production cut-in of the M4A1 in FY11. Solid Liquid Adapter (SLA) development kit is an interim capability using M4A1 as base detector. The JCAD-SLA funding in FY20 will provide test support costs to Other Government Agencies (OGA's) (Combat Capabilities Development Command (CCDC), Naval Surface Warfare Center

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (Op Sys Dev)
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(NSWC), Marine Corps Operational Test and Evaluation Agency (MCOTEA), Army Test and Evaluation Command (ATEC)), operational testing, first article testing, Pressure Breathing for Altitude (PBA) testing with Chemical Biological Center (CBC), logistics demonstration, and completion of testing from FY19.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) EXANA MOD</p> <p><b>Description:</b> Expeditionary Analytics</p> <p><b>FY 2021 Plans:</b> Funding supports the evaluation of analytical components for technical refreshment of the Common Analytical Laboratory System (CALs) and Analytical Laboratory System (ALS) Modification (MOD). Plans include, identifying new Fourier Transform Infrared Spectroscopy (FTIR)'s, new toxin identifiers, new Ion Mobility Spectrometry (IMS) chemical agent detector, new computer subsystems and testing the Hydrogen 2 generators.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Project CM7 ALS MOD funding was transferred in FY21 to Project CA7 - Expeditionary Analytics (EXANA) funding line.</p>	-	-	2.378
<p><b>Title:</b> 2) CBRN Dismounted Reconnaissance System (CBRN DRS) - Obsolescence</p> <p><b>Description:</b> Provide analysis of the existing components of CBRN Dismounted Reconnaissance Systems to ensure current requirements baseline can be met. Identify potential obsolescence in current components, identify concerns with current components (technical, human factors, sustainment), assess the current market, procurement and testing of candidates that could correct concerns, and integrate the new items into the product baseline. Identifies and tests technology that can meet emerging requirements.</p> <p><b>FY 2020 Plans:</b> Continue and complete market analyses on emerging technologies for potential upgrades to the system. Continue obsolescence management activities for existing field components. Continue purchasing components for testing. Continue testing of potential candidates. Initiate and complete changes to product baseline.</p> <p><b>FY 2021 Plans:</b> Continue obsolescence management activities for existing fielded components. Continue/complete purchasing of components for testing. Continue and complete testing of potential candidates. Incorporate successful candidates to product baseline.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b></p>	6.115	6.386	4.107

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 (Op Sys Dev)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured. Decrease in obsolescence management activities to focus on system enhancements packages to meet updated requirements.			
<p><b>Title:</b> 3) CBRN DRS - Development of System Enhancement Packages</p> <p><b>Description:</b> Identify and test solutions to meet evolving demands of the National Defense Strategy (NDS) to Counter Weapons of Mass Destruction via a System Enhancement Package to support dismounted reconnaissance, sensitive site assessment and exploitation, and render safe operations. Efforts will be focused on system enhancement packages for improved biological detection, improved protective equipment, improve chemical detection, and improved battlespace awareness.</p> <p><b>FY 2021 Plans:</b> Initiate and conduct market analyses on emerging technologies for system enhancement packages to meet required changes to the system. Identify, procure and test technologies to support specific improved capability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in validated JCIDS requirement document. FY21 Increase due to updated requirements to meet emerging operational needs above prior baseline.</p>	-	-	9.304
<p><b>Title:</b> 4) Joint Chemical Agent Detector (JCAD) Solid Liquid Adapter (SLA)</p> <p><b>Description:</b> Product Development, Verification Testing and Program Management</p> <p><b>FY 2020 Plans:</b> Initiated and completed JCAD SLA Contract to verify production readiness with First Article Testing, complete production verification testing and program management support.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project transitioned to Production and Deployment Phase. JCAD-SLA doesn't have any RDT&amp;E funding after FY20.</p>	-	3.892	-
<b>Accomplishments/Planned Programs Subtotals</b>	6.115	10.278	15.789

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

**Remarks**

**D. Acquisition Strategy**  
EXPEDITIONARY ANALYTIC MODERNIZATION (EXANA MOD)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Op Sys Dev)

The Common Analytical Laboratory System (CALs) and the Analytical Laboratory System (ALS) Modification (MOD) program's objective is to address critical analytical equipment obsolescence (Analytical Suite) and system functionality issues for the National Guard Bureau's (NGB) Civil Support Teams. This includes market survey, down select, testing, integration, and update of Technical Data Package and logistical documentation. It is anticipated that Capability Development Document (CDD) updates will be finalized for the CALs Theater Validation Integrated System (TV IS) and Field Confirmatory Analytical Capability Set (FC ACS) variants in FY20. As such, this program will follow continue to follow the most up-to-date requirement documentation for CALs and ALS MOD.

**CBRN DISMOUNTED RECONNAISSANCE SYSTEMS**

The Chemical Biological Radiological Dismounted Reconnaissance Systems (CBRN DRS) program uses a GOTS/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. Current efforts focus on maintaining baseline capabilities through obsolescence management and technology insertions. In order to meet the demands of the National Defense Strategy (NDS) to Counter Weapons of Mass Destruction, units equipped with the CBRN DRS must be able to both assess CBRN hazards and exploit them. Advancing threats and current capability gaps in sensitive site exploitation capability require a System Enhancement Package (SEP) to the baseline CBRN DRS. In FY21 and beyond, the Defense-Wide Review reduced this program for higher priorities.

**JOINT CHEMICAL AGENT DETECTOR (JCAD)**

The JCAD SLA kit will be an Additional Authorized List (AAL) item to the M4A1 JCAD. The JCAD SLA attaches to the JCAD and expands existing JCAD capability to detect NTAs, PBAs (opioids and fentanyl), and explosives. The JCAD SLA acquisition strategy will award a FFP / CPFF IDIQ to produce the required JCAD SLA quantities based on service requirements with initial fielding in fourth quarter FY20 to SOCOM.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (Op Sys Dev)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
CBRN DRS - HW C - HW - Product Development	MIPR	Defense Logistics Agency : Philadelphia, PA	2.277	0.580	Jan 2019	0.974	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN DRS - HW C - ECBC - Matrix	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.475	0.000		0.000		0.653	Nov 2020	-		0.653	Continuing	Continuing	0.000
CBRN DRS - HW - Product Development	MIPR	Various : Various	1.466	1.683	Nov 2018	0.750	Nov 2019	2.270	Nov 2020	-		2.270	Continuing	Continuing	0.000
JCAD - HW C - Contract	SS/FFP	Smiths Detection : Edgewood, MD	0.000	0.000		1.350	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			4.218	2.263		3.074		2.923		-		2.923	Continuing	Continuing	N/A

**Remarks**

CBRN DRS FY21 changes due to updated requirements and acquisition strategy to meet those requirements.

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
EXANA MOD - ES C - Science & Engineering Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.412	Nov 2020	-		0.412	Continuing	Continuing	0.000
CBRN DRS - ES - Market Analysis	MIPR	Various : Various	1.878	0.000		0.500	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN DRS - ES C - Product Analysis	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	1.271	1.013	Feb 2019	0.000		2.395	Nov 2020	-		2.395	Continuing	Continuing	0.000
CBRN DRS - ES - Obsolescence Management	MIPR	Various : Various	2.076	0.793	Feb 2019	1.000	Nov 2019	2.969	Nov 2020	-		2.969	Continuing	Continuing	0.000
<b>Subtotal</b>			5.225	1.806		1.500		5.776		-		5.776	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (Op Sys Dev)
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Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			

**Remarks**  
CBRN DRS FY21 changes due to updated requirements and acquisition strategy to meet those requirements.

Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
EXANA MOD - DTE C - Component Testing & Evaluation	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		1.668	Nov 2020	-		1.668	Continuing	Continuing	0.000
CBRN DRS - OTE - Candidate Testing	Various	Various : Various	4.806	0.294	Feb 2019	1.780	Mar 2020	1.961	Nov 2020	-		1.961	Continuing	Continuing	0.000
CBRN DRS - DTE - OTE - Candidate Testing	C/CPFF	Defense Technical Information Center (DTIC) : Fort Belvoir, VA	0.942	1.022	Jun 2019	0.000		0.978	Nov 2020	-		0.978	Continuing	Continuing	0.000
JCAD - DTE C - Test and Evaluation	MIPR	Various : Various	0.000	0.000		2.100	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			5.748	1.316		3.880		4.607		-		4.607	Continuing	Continuing	N/A

**Remarks**  
CBRN DRS FY21 changes due to updated requirements and acquisition strategy to meet those requirements.

Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
EXANA MOD - PM/M S - Program and Engineering Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.298	Jan 2021	-		0.298	Continuing	Continuing	0.000
CBRN DRS - PM - Program Management	MIPR	JPM NBC Contamination Avoidance (JPM)	1.892	0.730	Dec 2018	1.382	Nov 2019	2.185	Nov 2020	-		2.185	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 (Op Sys Dev)
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<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
and Systems Engineering Support		NBC CA) : JPEO, Aberdeen Proving Ground, MD													
JCAD - PM/MS C - Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.442	Oct 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			1.892	0.730		1.824		2.483		-		2.483	Continuing	Continuing	N/A

**Remarks**  
CBRN DRS FY21 changes due to updated requirements and acquisition strategy to meet those requirements.

	<b>Prior Years</b>	<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	17.083	6.115		10.278		15.789		-		15.789	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program			<b>Date:</b> February 2020
<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 (Op Sys Dev)	

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
EXANA MOD - CALS & ALS MOD - Upgrade Fielded Systems																												
CBRN DRS - Test components to replace obsolete items and insert new technologies																												
CBRN DRS - SystemEnhancement Packages (Variant #1) Production Decision																												
CBRN DRS - SystemEnhancement Packages (Variant #2) Production Decision																												
CBRN DRS - SystemEnhancement Packages (Variant #3) Production Decision																												
CBRN DRS - SystemEnhancement Packages (Variant #4) Production Decision																												
JCAD - JCAD ECP- SLA kit Development																												
JCAD - JCAD ECP- SLA ECP Approved (Milestone Event)																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 (Op Sys Dev)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EXANA MOD - CALS & ALS MOD - Upgrade Fielded Systems	1	2021	4	2021
CBRN DRS - Test components to replace obsolete items and insert new technologies	1	2019	4	2024
CBRN DRS - SystemEnhancement Packages (Variant #1) Production Decision	4	2020	4	2020
CBRN DRS - SystemEnhancement Packages (Variant #2) Production Decision	4	2021	4	2021
CBRN DRS - SystemEnhancement Packages (Variant #3) Production Decision	4	2022	4	2022
CBRN DRS - SystemEnhancement Packages (Variant #4) Production Decision	4	2023	4	2023
JCAD - JCAD ECP- SLA kit Development	1	2020	4	2020
JCAD - JCAD ECP- SLA ECP Approved (Milestone Event)	1	2021	1	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
CM7: <i>Homeland Defense (Op Sys Dev)</i>	-	1.214	2.286	1.421	-	1.421	1.420	3.335	3.337	1.506	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project supports technology refresh of fielded analytical laboratory system capabilities to conduct on-site analysis of any unknown sample and test potential life-threatening substances.

Efforts included in this Project are:

- (1) Common Analytical Laboratory System (CALs) and Analytical Laboratory System Modification (ALS MOD)
- (2) Weapons of Mass Destruction Civil Support Team (WMD CST)

The CALs / ALS MOD funding supports the evaluation of analytical components for technical refreshment and upgrades of key components of the CALs and ALS MOD systems that have become obsolete, or are no longer being supported by the manufacturer. This allows the CALs and ALS MOD users to maintain their operational capability and operational effectiveness. Note, CALs / ALS MOD funding for FY21 and beyond has transitioned to the Project CA7 line.

WMD-CST 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. Efforts in the program element support upgrades of key components of the WMD CST Program that have become obsolete, or are no longer being supported by the manufacturer.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) ALS MOD	-	0.847	-
<b>Description:</b> This program element supports the evaluation of analytical components for technical refreshment of the ALS MOD. Efforts in the program element support upgrades of key components of the ALS MOD systems that have become obsolete, or are no longer being supported by the manufacturer. This allows the ALS MOD users to maintain their operational capability and operational effectiveness.			
<b>FY 2020 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Conduct component and system level logistics evaluations to assess viability of candidate analytical upgrade components. Conduct system related test activities including costs of test candidate selection, testing hardware, engineering data to assess the performance of the system, test planning, execution of testing, data interpretation and reporting.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. ALS MOD funding transferred in FY21 to Project CA7 - Expeditionary Analytics (EXANA) funding line.</p>				
<p><b>Title:</b> 2) WMD CST</p> <p><b>Description:</b> The WMD CST Program supports the fielded system upgrade and ongoing assessment and acquisition of COTS and GOTS analytical detection, protection, decontamination and sampling equipment for survey in order to expand/enhance the operational capabilities of the (57) WMD CST Teams. Efforts in the program element support upgrades of key components of the WMD CST Program that have become obsolete, or are no longer being supported by the manufacturer.</p> <p><b>FY 2020 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. Provides functions of logistics engineering and ILS management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system).</p> <p><b>FY 2021 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. Provides functions of logistics engineering and ILS management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system).</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.</p>		1.214	1.439	1.421
<b>Accomplishments/Planned Programs Subtotals</b>		1.214	2.286	1.421
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

**D. Acquisition Strategy**

**ANALYTICAL LABORATORY SYSTEM MODIFICATION (ALS MOD)**

The Common Analytical Laboratory System (CALs) and the Analytical Laboratory System (ALS) Modification (MOD) program's objective is to address critical analytical equipment obsolescence (Analytical Suite) and system functionality issues for the National Guard Bureau's (NGB) Civil Support Teams. This includes market survey, down select, testing, integration, and update of Technical Data Package and logistical documentation. As such, this program will follow continue to follow the most up-to-date requirement documentation for CALs and ALS MOD.

**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, this is to address analytical equipment obsolescence. 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.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
ALS MOD - ILS S - ALS MOD	Various	TBD : N/A	0.000	0.000		0.255	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
WMD CST - ES C - Science & Engineering Support	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.150	Nov 2020	-		0.150	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		0.255		0.150		-		0.150	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
ALS MOD - OTE C	Various	TBD : N/A	0.000	0.000		0.325	Mar 2020	0.000		-		0.000	Continuing	Continuing	0.000
WMD CST - OTH C - CBRN COTS Component	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	4.904	0.820	Mar 2019	0.889	Feb 2020	0.923	Feb 2021	-		0.923	Continuing	Continuing	0.000
<b>Subtotal</b>			4.904	0.820		1.214		0.923		-		0.923	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
ALS MOD - PM/MS SB - ALS MOD	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.267	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
WMD CST - PM/MS SB - CBRN COTS	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	1.761	0.394	Jan 2019	0.550	Jan 2020	0.348	Dec 2020	-		0.348	Continuing	Continuing	0.000
<b>Subtotal</b>			1.761	0.394		0.817		0.348		-		0.348	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2021 Chemical and Biological Defense Program								<b>Date:</b> February 2020			
<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>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>		<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>	6.665	1.214	2.286		1.421	-	1.421	Continuing	Continuing	N/A	

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

ALS MOD - ALS MOD / CALS- Technology Refresh																												
WMD CST - Upgrade Fielded Systems																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ALS MOD - ALS MOD / CALS- Technology Refresh	1	2020	4	2020
WMD CST - Upgrade Fielded Systems	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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> C07 / Collective Protection (Op Sys Dev)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
C07: Collective Protection (Op Sys Dev)	-	3.270	5.755	7.865	-	7.865	8.316	9.563	4.682	2.988	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project provides for technology upgrade and refresh of fielded Collective Protection (CP) equipment and systems that are smaller, lighter, less costly to produce and maintain, and more logistically supportable enabling mission accomplishment in spaces safe from the effects of chemical, biological, and radiological (CBR) contamination.

Efforts included in this project are:

- (1) Joint Expeditionary Collective Protection (JECP)
- (2) Modernization Protection Collective Protection (MODPROT CP)

JECP provides the Joint Forces a CP capability which is lightweight, compact, modular, and affordable. Modernization and improvement efforts addressed include development of a field leakage test capability that allows Warfighters to validate the integrity of JECP and other fielded CP systems; integration of a newly developed filtration material into existing M98 Gas Particulate Filter Sets to provide the Warfighter with improved protection against Toxic Industrial Chemicals (TICs) and Toxic Industrial Materials (TIMs), while maintaining current performance characteristics against Chemical Warfare Agents (CWAs) and meeting military standards; development of a CP kit for non-CP Environmental Control Units (ECUs) and improvement on the current tent liner restraint systems.

Starting in FY21, JECP BA7 funding and efforts are transitioning under the MODPROT CP budget line.

MODPROT CP provides upgrades, improvements and modernizations to fielded Collective Protection Systems such as Mobile ColPro Systems, Fixed Site ColPro Systems, Transportable ColPro Systems, Modular CP Equipment Systems, and Collectively Protected Field Hospitals (CPFH). Efforts addressed include the M98 filter set life extension, modernization of the shipboard and fixed facility obsolete collective protection M98 filter housings and system controls, identification and testing of replacements for obsolete M93 and M59 Gas Particulate Filter Unit (GPFU) components used in numerous hard shelter systems. MODPROT CP also addresses obsolescence issues in test quality standards for gas filters, modernizes shipboard & fixed facility collective protection, M48 filters, and collective protection training, and evaluates reduced airflow on Chem Bio Radiological (CBR) filters.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) JECP	2.718	1.997	-
<b>Description:</b> Phase 1 & 2 - Field Leakage Test Capability (FLTC), M98 gas particulate filter sets, CP kit for Non-CP Environmental Control Units (ECU), and tent liner restraint system improvement			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> C07 / Collective Protection (Op Sys Dev)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Conduct Limited User Evaluation. Finalize logistic products and TDP in preparation for production decision and fielding. Optimize selected solution and conduct final developmental and operational testing and finalize logistic products and TDP in preparation for production decision and fielding. Design and develop improvements to the JECF liner to address the restraint system, hanging mechanisms and floor saver and improve the design of the single and multiple personnel entrance liner interfaces. Identify impacts to JECF tech data and logistics products. Finalize logistics products and TDP.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (JECF to MODPROT CP)</p>			
<p><b>Title:</b> 2) MODPROT</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded CP systems</p> <p><b>FY 2020 Plans:</b> Begin Electromagnetic Interference (EMI) testing on the M93 Gas Particulate Filter Unit (GPFU), continue evaluating CPDEPMEDS CP equipment, and complete environmental M98 guard bed testing. Conduct Non-Destructive Production Acceptance Leak Test with candidate tracer gases on CP Gas Filters. Complete market research/material replacement for Ventilated Face Piece Hose refresh. Initiate characterization on the raw material substrates of ASZM-TEDA (Copper-Silver-Zinc-Molybdenum-Triethylenediamine) carbon detail specification First Article Test (FAT) requirement. Initiate design of shipboard/ fixed site filter housing modernization.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (MODPROT to MODPROT CP)</p>	0.552	3.758	-
<p><b>Title:</b> 3) MODPROT CP</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded CP systems</p> <p><b>FY 2021 Plans:</b> Complete Electromagnetic Interference (EMI) testing on the M93/M59 Gas Particulate Filter Unit (GPFU), complete environmental M98 guard bed testing, complete Non-Destructive Production Acceptance Leak Test improvements. Complete characterization on the raw material substrates of ASZM-TEDA (Copper-Silver-Zinc-Molybdenum-Triethylenediamine) carbon detail specification First Article Test (FAT) requirement. Complete testing for the seals of the M48A1 Filter Redesign. Begin evaluation of reduced airflow effects on CBR filters. Begin Collective Protection Modernization for Ships and Buildings redesign and acquire component prototypes of modernized M98 filter housing. Begin development of updated training</p>	-	-	7.865

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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> C07 / Collective Protection (Op Sys Dev)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
materials for Collective Protection systems.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (MODPROT and JECF to MODPROT CP)			
<b>Accomplishments/Planned Programs Subtotals</b>	3.270	5.755	7.865

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

**Remarks**

**D. Acquisition Strategy**  
JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECF)

JECF Family of Systems (FoS) (Phase 1 and Phase 2) involves multiple contract types throughout the Engineering and Manufacturing Development (EMD) and Production and Deployment Phases of the program. Having achieved a Full Rate Production (FRP) decision for Phase 1 Systems in December 2016, the program exercised Fixed Price Incentive (FPI) production options in FY17 & FY18 through the now expired contract with Leidos in support of Initial Operational Capability (IOC). A competitive build-to print follow-on production delivery order contract was awarded June 2019 to Production Products Manufacturing and will support the remaining production of Phase 1 Systems to meet Full Operational Capability (FOC). Phase 2 systems will be developed as engineering changes to the Phase 1 systems under a separate competitive delivery order awarded March 2019 to Leidos and undergo limited developmental and operational testing in pursuit of a FRP decision. Production options are included in the delivery order to meet FOC for Phase 2 systems. Additionally, BA7 funding will develop incremental improvements to fielded JECF FoS. BA7 efforts include a range of improvements intended to enhance filtration protection, provide a field leakage test capability and update various fielded Environmental Control Unit (ECU) interface types for use with collective protection. These efforts involve development of designs and prototyping under the Other Transaction Authority (OTA) through the Countering Weapons Mass Destruction (CWMD) Consortium contract as well as exploitation of commercial off-the-shelf items.

MODERNIZATION PROTECTION (MODPROT)

In FY21, MODPROT will be split into three programs to fund three separate Modernization Efforts: Modernization Protection Collective Protection (MODPROT CP), Modernization Protection Decontamination (MODPROT DE), and Modernization Protection Individual Protection (MODPROT IP). The original MODPROT acquisition strategies will continue to be followed after the transition occurs in FY21.

Modernization Collective Protection (MODPROT CP) 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

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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>	C07 / <i>Collective Protection (Op Sys Dev)</i>

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.

**MODERNIZATION PROTECTION COLLECTIVE PROTECTION (MODPROT CP)**

MODPROT CP 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 systems' updated Technical Data Packages (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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> C07 / Collective Protection (Op Sys Dev)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
JECP - HW C - FLTC, M98 Filter Sets, ECUs, Tent Liner Restraint Systems	Various	Various : Various	0.328	2.073	Nov 2018	1.316	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - HW C - Compatibility Engineering M93 GPFU/ASZM-TEDA Carbon Dtl Spec FAT Reqmt/M48A1 Filter Redesign/Corrosion Mitigation	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.378	0.145	Nov 2018	1.359	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT CP - HW C - Collective Protection Modernization for Ships	Various	TBD : N/A	0.000	0.000		0.000		2.500	Dec 2020	-		2.500	Continuing	Continuing	0.000
MODPROT CP - HW C - Reduced Airflow M98 Filters, Filter Redesign, Non-Destructive Leak Test, ASZM Spec, CPS Training	MIPR	Various : Various	0.000	0.000		0.000		0.640	Dec 2020	-		0.640	Continuing	Continuing	0.000
<b>Subtotal</b>			0.706	2.218		2.675		3.140		-		3.140	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
MODPROT - ES C - Engineering Support	MIPR	Various : Various	0.164	0.330	Nov 2018	1.187	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT CP - ES C - IPT, Technical, Engineering and Logistics Support	MIPR	Various : Various	0.000	0.000		0.000		1.105	Dec 2020	-		1.105	Continuing	Continuing	0.000
<b>Subtotal</b>			0.164	0.330		1.187		1.105		-		1.105	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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> C07 / Collective Protection (Op Sys Dev)
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<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
JECP - DTE C - Improved M98 Filter Set Developmental Testing	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.460	0.178	Nov 2018	0.350	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - DTE C - M93 GPFU Environmental & EMI Testing/M98 Guard Bed Filter Life Extension/VFP Hose Refresh	MIPR	Various : Various	0.000	0.077	Nov 2018	0.423	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT CP - DTE C - CP Modernization Testing	Various	Various : Various	0.000	0.000		0.000		1.967	Dec 2020	-		1.967	Continuing	Continuing	0.000
<b>Subtotal</b>			0.460	0.255		0.773		1.967		-		1.967	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
JECP - PM/MS C - Program Management Support	MIPR	Various : Various	1.533	0.467	Dec 2018	0.331	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000	Dec 2018	0.789	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT CP - PM/MS C - Program Management Support	MIPR	Various : Various	0.000	0.000		0.000		1.653	Dec 2020	-		1.653	Continuing	Continuing	0.000
<b>Subtotal</b>			1.533	0.467		1.120		1.653		-		1.653	Continuing	Continuing	N/A

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>		2.863	3.270	5.755	7.865	-	7.865	Continuing	Continuing	N/A

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> C07 / Collective Protection (Op Sys Dev)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
JECP - Improved M98 Filter Set Development and lab-scale testing	██████																											
JECP - Field Leakage Tester Development and Prototype Testing	████████████████																											
JECP - Finalize Tech Data & Log Products - ECU	████████████████																											
JECP - Improved M98 Filter Set - Build and test					████████████████																							
JECP - Field Leakage Tester Limited User Prototype Test					██████																							
JECP - Liner Restraint Development					████████████████																							
JECP - Finalize Tech Data & Log Products - Liner Restraint					████████████████																							
JECP - Build and test final selected prototype - Improved M98 Filter Set					████████████████																							
MODPROT - M93 GPFU Electro Magnetic Interference	████████████████				████████████████																							
MODPROT - Environmental M98 Guard Bed Testing	████████████████				████████████████																							
MODPROT - CP DEPMEDS Redesign	████████████████				████████████████																							
MODPROT - VFP Hose Refresh	████████████████				████████████████																							
MODPROT - Non Destructive (ND) Acceptance Leak Test CP Filters	████████████████				████████████████																							
MODPROT - ASZM-TEDA Carbon Dtl Spec FAT Reqmt					████████████████																							
MODPROT - Next Generation ColPro System					████████████████																							
MODPROT CP - M93 GPFU Electro Magnetic Interference									████████████████																			

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> C07 / Collective Protection (Op Sys Dev)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
MODPROT CP - Environmental M98 Guard Bed Testing																												
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters																												
MODPROT CP - ASZM-TEDA Carbon Dtl Spec FAT Reqmt																												
MODPROT CP - M48A1 Filter Redesign																												
MODPROT CP - Reduced Airflow Effects on Colpro Filters																												
MODPROT CP - Collective Protection Modernization for Ships and Buildings																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> C07 / Collective Protection (Op Sys Dev)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JECP - Improved M98 Filter Set Development and lab-scale testing	1	2019	2	2019
JECP - Field Leakage Tester Development and Prototype Testing	1	2019	2	2020
JECP - Finalize Tech Data & Log Products - ECU	1	2019	2	2020
JECP - Improved M98 Filter Set - Build and test	3	2019	2	2020
JECP - Field Leakage Tester Limited User Prototype Test	4	2019	1	2020
JECP - Liner Restraint Development	1	2020	4	2020
JECP - Finalize Tech Data & Log Products - Liner Restraint	1	2020	4	2020
JECP - Build and test final selected prototype - Improved M98 Filter Set	2	2020	4	2020
MODPROT - M93 GPFU Electro Magnetic Interference	1	2019	4	2020
MODPROT - Environmental M98 Guard Bed Testing	1	2019	4	2020
MODPROT - CP DEPMEDS Redesign	1	2019	4	2020
MODPROT - VFP Hose Refresh	1	2019	4	2020
MODPROT - Non Destructive (ND) Acceptance Leak Test CP Filters	1	2019	4	2020
MODPROT - ASZM-TEDA Carbon Dtl Spec FAT Reqmt	1	2020	4	2020
MODPROT - Next Generation ColPro System	1	2020	4	2020
MODPROT CP - M93 GPFU Electro Magnetic Interference	1	2021	4	2021
MODPROT CP - Environmental M98 Guard Bed Testing	1	2021	4	2021
MODPROT CP - Non Destructive (ND) Acceptance Leak Test CP Filters	1	2021	4	2021
MODPROT CP - ASZM-TEDA Carbon Dtl Spec FAT Reqmt	1	2021	4	2021
MODPROT CP - M48A1 Filter Redesign	1	2021	4	2023
MODPROT CP - Reduced Airflow Effects on Colpro Filters	1	2021	4	2023
MODPROT CP - Collective Protection Modernization for Ships and Buildings	1	2021	4	2025

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> DE7 / Decontamination (Op Sys Dev)
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COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
DE7: Decontamination (Op Sys Dev)	-	0.307	1.442	0.633	-	0.633	0.634	0.634	0.634	0.635	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project addresses obsolescence issues with decontamination equipment and the need to modernize the Joint Services fielded chemical and biological with capabilities meeting or exceeding the Services requirements.

The effort included in this project is:

- (1) Modernization Protection Decontamination (MODPROT DE)

MODPROT DE addresses obsolescence and technical data concerns, beginning with the M26 Joint Services Transportable Decontamination System-Small Scale (JSTDS-SS) through validation and verification of Technical Manual (TM) changes as well as technical data for spare and repair parts; the M12A1 Power Driven Decontamination Apparatus (PDDA) by updating technical references and performing the necessary validation and verification before publishing an updated TM; Conduct biological efficacy at relevant environment (i.e. ambient, desert, cold) for Joint Service Equipment Wipe (JSEW) to expand wipe capabilities to include performance against biological agents; and Conduct efficacy of emerging sorbent technologies for M295/M100 to increase reactivity properties against nerve agents.

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

	FY 2019	FY 2020	FY 2021
<p><b>Title:</b> 1) MODPROT</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded DE systems</p> <p><b>FY 2020 Plans:</b> Initiate biological efficacy testing at relevant environment (i.e. ambient, desert, cold) for Joint Service Equipment Wipe (JSEW) to expand wipe capabilities to include performance against biological agents. Update inaccuracies and conduct validation/verification for the M26 JSTDS-SS TM. Initiate update for technical data for spares and repair parts for M26 JSTDS-SS TDP. Begin update of technical references and conduct validation/verification for the M12A1 PDDA TM.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (MODPROT to MODPROT DE)</p>	0.307	1.442	-
<p><b>Title:</b> 2) MODPROT DE</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded DE systems</p>	-	-	0.633

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> DE7 / Decontamination (Op Sys Dev)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b><i>FY 2021 Plans:</i></b> Continue biological efficacy effort at relevant environment (i.e. ambient, desert, cold) for Joint Service Equipment Wipe (JSEW) to expand wipe capabilities to include performance against biological agents. Continue updates to technical data for spares and repair parts for M26 JSTDS-SS Technical Data Package (TDP). Continue updates to technical references and validation/verification efforts for M12A1 Power Driven Decontamination Apparatus (PDDA) Technical Manual (TM). Initiate efficacy of emerging sorbent technologies for the M295/M100 to increase reactivity properties against nerve agents. Conduct Health Hazard Assessment (HHA) on expired M295/M100 for potential training use.</p> <p><b><i>FY 2020 to FY 2021 Increase/Decrease Statement:</i></b> Program/project funding transferred from another funding line. (MODPROT to MODPROT DE)</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	0.307	1.442	0.633

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

N/A

**Remarks**

**D. Acquisition Strategy**

MODERNIZATION PROTECTION (MODPROT)

In FY21, MODPROT will be split into three programs to fund three separate Modernization Efforts: Modernization Protection Collective Protection (MODPROT CP), Modernization Protection Decontamination (MODPROT DE), and Modernization Protection Individual Protection (MODPROT IP). The original MODPROT acquisition strategies will continue to be followed after the transition occurs in FY21.

Modernization Collective Protection (MODPROT CP) 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.

MODERNIZATION DECONTAMINATION (MODPROT DE)

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<b>Appropriation/Budget Activity</b>	<b>R-1 Program Element (Number/Name)</b>	<b>Project (Number/Name)</b>
0400 / 7	PE 0607384BP / CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)	DE7 / Decontamination (Op Sys Dev)

MODPROT DE leverages mature technology from contractor developed components to address and replace obsolete components of various fielded decontamination 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 (TDPs) to be used in Engineering Change Proposals (ECPs) and provided to the item managers.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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> DE7 / Decontamination (Op Sys Dev)
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<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
MODPROT - HW C - Market Research	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.192	Mar 2019	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT DE - HW C - M26/M295/M100/JSEW Modernization / Health Hazard Assessment (HHA)	MIPR	Various : Various	0.000	0.000		0.000		0.334	Dec 2020	-		0.334	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.192		0.000		0.334		-		0.334	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
MODPROT - TD/D C - TDP & TM Updates/ Engineering Support	MIPR	Various : Various	0.000	0.115	Mar 2019	0.590	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT DE - ES C - M26 Tech Data Package; Modernization Update / M12A1 TM Update	MIPR	Various : Various	0.000	0.000		0.000		0.166	Dec 2020	-		0.166	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.115		0.590		0.166		-		0.166	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
MODPROT - OTE C - JSEW Bio Capability Testing	Various	Various : Various	0.000	0.000		0.444	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		0.444		0.000		-		0.000	Continuing	Continuing	N/A



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> DE7 / Decontamination (Op Sys Dev)
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	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
MODPROT - Decontamination Market Research and Parts Modeling	██████████																											
MODPROT - Decontamination TM Drawing Development and Special Packaging	██████████																											
MODPROT - Technical Data Package (TDP)	████████████████████																											
MODPROT - M26 JSTDS-SS TM Update/ Modernization Effort					██████████																							
MODPROT - M12A1 Tech Manual Update					██████████																							
MODPROT - JSEW Bio Capability Testing					██████████																							
MODPROT DE - M12A1 TM Update									████																			
MODPROT DE - M26 JSTDS-SS TDP									████████████████																			
MODPROT DE - JSEW Bio Capability Testing									████████████████																			
MODPROT DE - M26 JSTDS-SS Modernization									██																			
MODPROT DE - M295/M100 Efficacy Testing									████████████████████																			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> DE7 / Decontamination (Op Sys Dev)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT - Decontamination Market Research and Parts Modeling	1	2019	4	2019
MODPROT - Decontamination TM Drawing Development and Special Packaging	1	2019	4	2019
MODPROT - Technical Data Package (TDP)	1	2019	4	2020
MODPROT - M26 JSTDS-SS TM Update/Modernization Effort	1	2020	4	2020
MODPROT - M12A1 Tech Manual Update	1	2020	4	2020
MODPROT - JSEW Bio Capability Testing	1	2020	4	2020
MODPROT DE - M12A1 TM Update	1	2021	1	2021
MODPROT DE - M26 JSTDS-SS TDP	1	2021	1	2022
MODPROT DE - JSEW Bio Capability Testing	1	2021	1	2022
MODPROT DE - M26 JSTDS-SS Modernization	1	2021	4	2025
MODPROT DE - M295/M100 Efficacy Testing	2	2021	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IP7: Individual Protection (Op Sys Dev)	-	2.087	6.080	6.463	-	6.463	8.447	8.429	8.431	7.533	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The project supports technology refresh of fielded individual protective equipment which enable the warfighter to operate in a contaminated CBR environment with little or no degradation to his/her performance.

Efforts included in this project are:

- (1) Modernization Protection Individual Protection (MODPROT IP)
- (2) Special Purpose Unit Rapid Capability Development and Deployment (SPU RCDD)
- (3) Joint Service General Purpose Mask (JSGPM)

MODPROT IP 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 IP will conduct qualification testing on the protective glove, Joint Service Integrated Suit Technology (JSLIST) Block 2 Glove Upgrade non- Flame Resistant (JB2GU nFR), to determine if storage life may be extended to 20 years from the Date of Manufacture. MODPROT IP will also conduct modernization efforts and reverse engineering of maintenance and repair procedures for the Joint Services Mask Leakage Tester (JSMLT). MODPROT IP will also provide mask and filter system upgrades and modernization of field protection systems to enhance respiratory and ocular protection.

The SPU RCDD will facilitate rapid response to near-term and emergent chemical-biological (CB) defensive capability requirements from elements of the Joint Special Operations Command (JSOC), select elements from across the Special Operations Forces (SOF) Enterprise and other Joint Force enabling units. SPU RCDD mitigates risk across the Chemical Biological Defense Program (CBDP) by creating a portfolio of operationally-relevant chemical and biological (CB) capabilities that can quickly transition to needed elements and formations of the joint force, in part or in whole, in response to the emergent capability needs of the geographic combatant commanders. These objectives are met by the early transitioning of promising science and technologies (S&T), the focused conduct of combat evaluations and mission-oriented operational assessments to assess technological and mission suitability, and the active leveraging of existing Commercial-Off-The-Shelf (COTS) products along with novel redesign approaches to modernize and optimize existing solutions to new challenges supported by "buy-try-decide-acquire" acquisition strategies. SPU RCDD will provide enhanced chemical, biological, radiological, and, nuclear (CBRN) detect and protect capabilities against new and emerging CBRN threats through modernized and technologically-mature component and system enhancements to currently fielded host platforms and legacy systems, thereby extending service life, off-setting costs to initiate a new acquisition program, and putting critical CBRN capabilities in the hands of warfighters by faster acceleration through the acquisition process.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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JSGPM provides for respiratory and ocular protection modernization and enhancements for Toxic Industrial Chemicals (TICs) and Toxic Industrial Materials (TIMs) protection and operational performance in air purifying, powered air purifying, and supplied air functional modes of the Joint Service General Purpose Mask (JSGPM) family of systems. Mask and filter system upgrades will be provided for fielded Protection systems to enhance respiratory and ocular protection.

Starting in FY21, JSGPM BA7 funding and efforts are transitioning under the MODPROT IP budget line.

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) MODPROT</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded IP systems.</p> <p><b>FY 2020 Plans:</b> Continue modernization of the Joint Service Mask Leakage Tester (JSMLT). Continue to modernize protective equipment equal to or exceeding requirements.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (MODPROT to MODPROT IP)</p>	0.402	1.490	-
<p><b>Title:</b> 2) MODPROT IP</p> <p><b>Description:</b> Upgrades, improvements, and modernizations to fielded IP systems.</p> <p><b>FY 2021 Plans:</b> Continue modernization of the JSMLT. Initiate and complete Next Generation Filter Engineering Change Proposal (ECP). Begin Third Generation Filter Prototype Developmental Testing (DT).</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. (MODPROT and JSGPM BA7 to MODPROT IP)</p>	-	-	3.001
<p><b>Title:</b> 3) SPU RCDD</p> <p><b>Description:</b> Modernization of Integrated Footwear System (IFS) &amp; Chemical Biological (CB) Protective Glove. The IFS is a CB protective sock/liner system that is worn over the combat sock and inside combat footwear. The IFS is made from selectively permeable membrane materials and incorporates an Aramid cuff. The CB protective gloves will provide hand protection from CB agents as well as Petroleum, Oil, &amp; Lubricants (POL) and flame protection.</p> <p><b>FY 2020 Plans:</b></p>	-	2.994	3.462

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Initiate and solicit industry for the most updated material solution to meet the current requirements for below-the-wrist and below-the-ankle enhanced protection. Perform design and functionality analysis to determine capability gap, and procure initial test articles to conduct baseline testing.</p> <p><b>FY 2021 Plans:</b> Initiate product enhancement development and technology upgrades on currently fielded equipment to counter emerging threats, conduct limited user evaluations and operational assessment, and provide program management support.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase due to change in program/project technical parameters.</p>			
<p><b>Title:</b> 4) JSGPM</p> <p><b>Description:</b> Product Qualification and Integration Testing</p> <p><b>FY 2020 Plans:</b> Complete Product Qualification Testing (PQT) of the Cobalt-Zinc, zirconium hydroxide, Argentum (Silver), TEDA (triethylene diamine)(CoZZAT) technology and Metal Organic Framework (MOF) into the M61 filter. Complete MOF Filter Prototype Testing. Continue Next Generation Filter Developmental Testing (DT). Evaluate JSGPM suit interface and communication improvements.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. (MODPROT IP)</p>	1.685	1.596	-
<b>Accomplishments/Planned Programs Subtotals</b>	2.087	6.080	6.463

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• JI0003: JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)	18.359	13.209	22.402	-	22.402	15.128	3.875	0.000	0.000	0.000	72.973

**Remarks**

**D. Acquisition Strategy**

MODERNIZATION PROTECTION (MODPROT)

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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> IP7 / Individual Protection (Op Sys Dev)
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In FY21, MODPROT will be split into three programs to fund three separate Modernization Efforts: Modernization Protection Collective Protection (MODPROT CP), Modernization Protection Decontamination (MODPROT DE), and Modernization Protection Individual Protection (MODPROT IP). The original MODPROT acquisition strategies will continue to be followed after the transition occurs in FY21.

Modernization Collective Protection (MODPROT CP) 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.

**MODERNIZATION PROTECTION INDIVIDUAL PROTECTION (MODPROT IP)**

MODPROT IP leverages mature technology from contractor developed components to address and replace obsolete components of various fielded individual 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.

**SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)**

Non-traditional projects will be executed for capabilities identified by Joint Special Operations Command (JSOC), select elements from across the Special Operations Forces (SOF) Enterprise, and other Joint Force enabling units. The SPU RCDD BA5 acquisition strategy for developmental efforts will allow rapid prototyping and testing of mission critical capabilities needed to enhance mission success. The SPU RCDD BA7 modernization effort will use technical and functional evaluations of currently-fielded items to introduce and incorporate operationally-relevant system developments. Both efforts will be accomplished by awarding an agreement through the Countering Weapons of Mass Destruction Other Transaction Authority (CWMD OTA) for the procurement of test assets. An OTA contracting approach will be used to procure test 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 OTAs, a Small Business Innovative Research contract, or a more traditional contracting vehicle.

**JS GENERAL PURPOSE MASK (JSGPM)**

The JSGPM Advanced Respiratory Protection Initiative (ARPI) allows for continual technology refreshment and development of an improved single mask filter that would be certified for use in both domestic and military operations. Existing Federal Acquisition Regulation (FAR) based contracts and Other Transaction Authority (OTA)

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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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contracts will be used to mature technologies transitioned from the Defense Threat Reduction Agency (DTRA) to obtain higher Technology Readiness Level (TRL) that can be inserted into fielded systems. The complexity of maturing these different items requires an evolutionary approach with one prototype iteration governing the approach on the next iteration.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
MODPROT - SW C - Modernization Support Tool	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.039	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT IP - HW C - Filter Prototypes & JSMLT Modernization	Various	Various : Various	0.000	0.000		0.000		1.460	Dec 2020	-		1.460	Continuing	Continuing	0.000
SPU RCDD - HW C - Product Development	Various	Various : Various	0.000	0.000		1.713	Dec 2019	1.983	Dec 2020	-		1.983	Continuing	Continuing	0.000
JSGPM - HW C - Filter Prototypes 3M & Avon/ NIOSH Filter procurement	Various	Various : Various	1.561	0.636	Dec 2018	0.760	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			1.561	0.675		2.473		3.443		-		3.443	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>
MODPROT IP - ES C - IPT, Engineering, Technical, Logistics Support	MIPR	Various : Various	0.000	0.000		0.000		0.357	Dec 2020	-		0.357	Continuing	Continuing	0.000
SPU RCDD - ES C - Technical Support	Various	Various : Various	0.000	0.000		0.299	Nov 2019	0.347	Dec 2020	-		0.347	Continuing	Continuing	0.000
JSGPM - ES C - IPT, Engineering, and Technical Support	MIPR	Various : Various	0.302	0.040	Nov 2018	0.072	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			0.302	0.040		0.371		0.704		-		0.704	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
MODPROT - OTE S - JSMLT Modernization	C/FFP	Hamilton Associates : DBA Air Techniques Intl., Owings Mills, MD	1.141	0.289	Sep 2019	1.172	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - OTE S - JB2GU Glove Study/ IFS Modernization/JSMLT Modernization	C/FFP	Various : Various	0.026	0.074	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT IP - DTE C - System Filters	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.553	Dec 2020	-		0.553	Continuing	Continuing	0.000
SPU RCDD - DTE C - Test and Evaluation	MIPR	Combat Capabilities Development Command (CCDC) Chemical Biological Center : Aberdeen Proving Ground, MD	0.000	0.000		0.500	Dec 2019	0.580	Jan 2021	-		0.580	Continuing	Continuing	0.000
JSGPM - DTE C - System Filters (CoZZAT)	MIPR	CCDC CBC : Aberdeen Proving Ground, MD	1.778	0.861	Jan 2019	0.423	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			2.945	1.224		2.095		1.133		-		1.133	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
MODPROT - PM/MS C - Program Management Support	MIPR	Various : Various	0.000	0.000		0.318	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT IP - PM/MS C - Program Management Support	MIPR	Various : Various	0.000	0.000		0.000		0.631	Dec 2020	-		0.631	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
MODPROT - Accelerated Aging Study MALO Replacement	██████████																											
MODPROT - JSMLT Modernization	██████████																											
MODPROT - JB2GU Glove Study/ IFS Modernization	██████████																											
MODPROT IP - JSMLT Modernization									██████████																			
MODPROT IP - Next Generation Filter ECP									██████████																			
MODPROT IP - Third Generation Filter Prototype DT													██████████															
MODPROT IP - Third Generation Filter Technology ECP																	██████████											
MODPROT IP - Fourth Generation Filter Prototype DT																					██████████							
SPU RCDD - Modernization Efforts					██████████																							
SPU RCDD - IFS Modernization					██████████																							
SPU RCDD - CB Protective Glove Modernization					██████████																							
JSGPM - Product Qualification Testing (CoZZAT)					██████████																							
JSGPM - Prototype Development (MOF and NIOSH)					██████████																							
JSGPM - Prototype Testing (MOF and NIOSH)					██████████																							
JSGPM - Next Generation Filter DT					██████████																							
JSGPM - MOF Integration into M61					██████████																							
JSGPM - Suit Interface & Communication Improvements Evaluation					██████████																							

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MODPROT - Accelerated Aging Study MALO Replacement	1	2019	4	2019
MODPROT - JSMLT Modernization	1	2019	4	2020
MODPROT - JB2GU Glove Study/ IFS Modernization	2	2019	4	2020
MODPROT IP - JSMLT Modernization	1	2021	4	2025
MODPROT IP - Next Generation Filter ECP	1	2021	2	2021
MODPROT IP - Third Generation Filter Prototype DT	2	2021	4	2023
MODPROT IP - Third Generation Filter Technology ECP	1	2024	2	2024
MODPROT IP - Fourth Generation Filter Prototype DT	2	2024	4	2025
SPU RCDD - Modernization Efforts	1	2020	4	2024
SPU RCDD - IFS Modernization	1	2020	4	2020
SPU RCDD - CB Protective Glove Modernization	1	2020	4	2020
JSGPM - Product Qualification Testing (CoZZAT)	3	2019	2	2020
JSGPM - Prototype Development (MOF and NIOSH)	1	2020	4	2020
JSGPM - Prototype Testing (MOF and NIOSH)	3	2019	4	2020
JSGPM - Next Generation Filter DT	1	2020	4	2020
JSGPM - MOF Integration into M61	2	2019	4	2020
JSGPM - Suit Interface & Communication Improvements Evaluation	2	2020	4	2020

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
IS7: Information Systems (Op Sys Dev)	-	14.039	16.111	3.234	-	3.234	3.554	15.381	15.383	16.154	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. During this phase efforts will execute modernization, bug fixes, and provide support at fielded locations and maintain training and logistics support.

Efforts included in this project are:

- (1) Global Biosurveillance Portal (Global-BSP),
- (2) Chemical Biological Radiological and Nuclear Information Systems (CBRN IS)
- (3) Joint Effects Model 1 and 2 (JEM 1 and 2)
- (4) Joint Warning and Reporting Network 1 and 2 (JWARN 1 and 2), and
- (5) Software Support Activity (SSA).

The Global-BSP is an unclassified, web-based computer and mobile application which facilitates collaboration, communication, and information sharing in support of the preparedness, detection, management, and mitigation of CBRN, as well as all hazard events. These capabilities enable the use of data visualization, real-time messaging and file sharing, and DoD and USG cooperation to expedite the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

CBRN IS provides the Joint warfighter, CBRN community of interest, and international partners a collaborative Cloud hosted environment. This cloud environment allows users to collect and disseminate CBRN warning and reporting data, provide detailed CBRN hazard predictions, aid in decision support, and make relevant CBRN defense information available in near-real time. CBRN IS supports the implementation of Integrated Early Warning (IEW) capabilities that allow users to access netted sensor information, data fusion, disease modeling, biosurveillance data, source term estimation data, incident management tools, and planning and analysis capabilities. The CBRN IS enterprise makes CBRN decision aids readily accessible from any computer through a web browser simplifying interoperability, reducing integration and deployment costs, and increasing cybersecurity protection.

The JEM 1 and JEM 2 are software applications that provide the Department of Defense (DoD) with the only operationally tested and accredited tools to model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. JEM 1 and JEM 2 apply advanced physics using weather, terrain, and agent characteristics to predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM). JEM 1 and JEM 2 display hazard information on the Common Operational Picture (COP) and allow commanders to assess risk and take steps mitigate the effects of Weapons of Mass Destruction (WMD) on operational forces. The JEM 1 program sunsets and has been replaced by JEM 2. JEM 1 program support will be terminated upon full expenditure of FY19 funding.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

The Joint Warning and Reporting Network (JWARN) 1 and 2 are software applications that provide the Department of Defense warning and reporting systems that enable an immediate and integrated response to threats of contamination by WMD, CBRN and TIM incidents. JWARN 1 and 2 provide a digital display of CBRN reports on the COP, presented through Service provided Command and Control systems resident at all echelons of command. Enhanced situational battlespace awareness provides Commanders the ability to support warfighter battle management and continuity of operations in a contaminated environment. The JWARN 1 program sunsets and has been replaced by JWARN 2 program and will no longer be supported at the end of FY20.

The SSA provides for enterprise services in the areas of software development, network architecture, cybersecurity, technology transition, and information assurance standards and policies to support programs with modernization and upgrade efforts to fielded systems to ensure network, cybersecurity, and standards compliance throughout the Chemical Biological Radiological and Nuclear Defense (CBRND) portfolio.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Title:</b> 1) Global-BSP</p> <p><b>Description:</b> Modernization Efforts</p> <p><b>FY 2020 Plans:</b> Begin moving Map servers to AWS (Amazon Web Services) GovCloud to improve performance; add FVEY (Five Eyes - US/UK/Canada/Australia/New Zealand)/NATO role-based access capability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	2.572	2.904	-
<p><b>Title:</b> 2) Global-BSP</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b> Continue to perform Training Development, Integrated Logistic Support, and Configuration Management.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	-	1.162	-
<p><b>Title:</b> 3) Global-BSP</p> <p><b>Description:</b> Management Support</p> <p><b>FY 2020 Plans:</b></p>	-	0.402	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support.				
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<b>Title:</b> 4) CBRN IS <b>Description:</b> Modernization Efforts  <b>FY 2020 Plans:</b> Modernize fielded capabilities throughout the lifecycle of the program to ensure compatibility with Service architectures, cloud-hosted environments, and system security requirements. Continue to update system with new technology and capability sets ensuring compliance with cyber security and net centric policies. <b>FY 2021 Plans:</b> Continue to modernize fielded capabilities throughout the lifecycle of the program to ensure compatibility with Service architectures, cloud-hosted environments, and system security requirements. Continue to update system with new technology and capability sets ensuring compliance with cyber security and net centric policies. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments.		2.259	1.841	2.057
<b>Title:</b> 5) JEM 1 and 2 <b>Description:</b> Command and Control (C2) Modernization Efforts  <b>FY 2020 Plans:</b> Continue to update fielded JEM 1 and 2 software due to changing Army, Navy, Air Force, 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 1 and JEM 2 baselines. Increased funding planned for the emerging cyber security threats. <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.		1.129	0.895	-
<b>Title:</b> 6) JEM 1 and 2 <b>Description:</b> Pre-Planned Product Improvement (P3I)		2.573	1.737	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>FY 2020 Plans:</b> Continue to test and integrate fielded JEM software with science and technology upgrades and model enhancements to improve JEM 1 and 2 accuracy and precision. Improve architecture and overall performance of all JEM 1 and 2 versions through software updates and deficiency resolution.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>			
<p><b>Title:</b> 7) JEM 1 and 2</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b> Perform Training Development, Integrated Logistics Support and Configuration Management for upgraded fielded capabilities.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	1.009	1.675	-
<p><b>Title:</b> 8) JEM 1 and 2</p> <p><b>Description:</b> Management Support</p> <p><b>FY 2020 Plans:</b> Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support to the fielded product baseline.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>	0.415	0.479	-
<p><b>Title:</b> 9) JWARN 1 and 2</p> <p><b>Description:</b> System Modernization/Update Development</p> <p><b>FY 2020 Plans:</b> Continue engineering and development efforts to upgrade existing operational JWARN capabilities hosted on Service C2 systems in order to maintain interoperability, efficiency, and functionality. Provide any required patches or fixes to address potential</p>	2.361	3.287	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>issues discovered in the course of recurring system interoperability testing with Service C2 environments. Performance test and evaluation of updated JWARN 2 baselines. Increased funding planned for the emerging cyber security threats.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>				
<p><b>Title:</b> 10) JWARN 1 and 2</p> <p><b>Description:</b> Program Management Support</p> <p><b>FY 2020 Plans:</b> Continue JWARN 1 and 2 strategic, tactical, planning, program/financial management/ costing, contracting, and acquisition oversight for JWARN software Service Command and Control (C2) systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.387	0.470	-
<p><b>Title:</b> 11) JWARN 1 and 2</p> <p><b>Description:</b> Test and Evaluation (T&amp;E)</p> <p><b>FY 2020 Plans:</b> Continue Government developmental and operational testing on software updates and modernization efforts on deployed JWARN 1 and 2 capabilities on Service C2 systems. Conduct DT on developer delivery of JWARN 1 and 2 software intended for fielding with Army and US Marine Corps C2 systems. Develop training guides and courseware to reflect major upgrades to JWARN 2 in support of Army and US Marine Corps C2 systems.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.</p>		0.313	0.235	-
<p><b>Title:</b> 12) JWARN 1 and 2</p> <p><b>Description:</b> Training and Logistics Support</p> <p><b>FY 2020 Plans:</b></p>		-	0.704	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
Provide helpdesk and training support for fielded versions of JWARN 1 and 2 in all host environments, including DISA milCloud, Army BCCS command post servers, Navy CANES and MOCs, and Marine Corps JTCW systems.  <b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being terminated.				
<b>Title:</b> 13) SSA  <b>Description:</b> SSA Policies, Standards and Guidelines  <b>FY 2020 Plans:</b> 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 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.		0.212	0.077	-
<b>Title:</b> 14) SSA  <b>Description:</b> Integrated Architecture  <b>FY 2020 Plans:</b> Provide and update programs 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 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.		0.219	0.099	-
<b>Title:</b> 15) SSA  <b>Description:</b> Chemical, Biological, Radiological, Nuclear Data Model  <b>FY 2020 Plans:</b>		0.202	0.144	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</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 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.			
<b>Title:</b> 16) SSA <b>Description:</b> Cybersecurity/Information Assurance	0.388	-	-
<b>Title:</b> 17) SSA <b>Description:</b> Enterprise Services	-	-	1.177
<b>FY 2021 Plans:</b> Support the Chemical Biological Radiological and Nuclear Defense (CBRND) enterprise through continuous engagement to assist with acquisition products for the modernization and sustainment of fielded products to ensure system compatibility, interoperability, and integration. Provide subject matter expertise in the areas of software development, network architecture, cybersecurity, information assurance, and standards and policies.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Bullets with similar activities spanning multiple fiscal years were consolidated.			
<b>Accomplishments/Planned Programs Subtotals</b>	14.039	16.111	3.234

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

N/A

**Remarks**

**D. Acquisition Strategy**

BIOSURVEILLANCE PORTAL (BSP)

The Global-BSP program is using the SOFCIDS (Special Operations Capabilities Integration and Development System) requirements approach and the JROC's "IT Box" acquisition construct which allows fielding of operational capabilities while continued R&D matures technology required for follow-on versions. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple iterative fielding events in lieu of a single fielding event, and field products to the warfighter utilizing an incremental delivery approach. The Global-BSP will achieve Full Operational Capability, complete resourced capabilities, and commence an orderly transition to sustainment in 2020. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

**CBRN INFORMATION SYSTEMS**

CBRN IS acquisition strategy utilizes a Family-of-Systems (FoS) approach to align multiple capabilities to the CBRN-IS architecture and operational environment. CBRN IS leverages the concepts of CBRN Hazard Awareness and Understanding and DISA Enterprise Services to integrate current CBRN capabilities, and other information and intelligence services, applications, and systems to provide increased situational awareness and decision support to commanders for CBRN defense. The strategy supports the implementation of integrated early warning capabilities by incorporating mature science and technology products and emerging technologies from existing advanced technology demonstrations (ATD) and experimental capability demonstrations (ECD). CBRN IS utilizes the Agile software development process to provide for the spiral development and fielding of modular capability packages.

**JOINT EFFECTS MODEL (JEM)**

The JEM 2 acquisition strategy utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching Milestone B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JEM will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

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

JWARN 2 acquisition utilizes Agile software development practices, employing the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fieldings in lieu of a single fielding event. As part of the strategy, an over-arching MS B and Build Decision for Requirements Definition Package 1 (RDP-1) were approved by the Milestone Decision Authority (MDA) in 4QFY14. Subsequent RDPs have been approved along with Capability Drops (CD) that define capability sets to be developed, tested, and fielded operationally. JWARN will prioritize and complete resourced CD's for RDP 1 and 2 to transition into sustainment. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities.

**SOFTWARE SUPPORT ACTIVITY (SSA)**

Software Support Activity (SSA) is a non-acquisition, service organization that provides professional subject matter expertise support throughout the CBDP Enterprise. These services are provided by government and contract personnel with expertise in software development, network architecture, cybersecurity, technology transitions, information assurance, and standards and policies compliance, and are provided throughout the lifecycle of programs within the CBDP portfolio. These efforts facilitate the efficient development, transition, fielding, modernization, and sustainment of interoperable and integrated CBRN capabilities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
BSP - SW S - Global-BSP Modernization	MIPR	Various : Various	1.753	2.338	Dec 2018	2.904	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JEM - SW S - Increment 2 - Modernization	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	7.425	3.702	Jan 2019	2.632	Jan 2020	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 1-SW S- Modernization	C/CPAF	DCS Corps : Alexandria, VA	0.000	0.000		0.699	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- SW S - Modernization Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.000	2.361	Dec 2018	2.589	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
SSA - SW S - Development Services	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.631	0.460	Feb 2019	0.144	Feb 2020	0.529	Feb 2021	-		0.529	Continuing	Continuing	0.000
<b>Subtotal</b>			12.809	8.861		8.968		0.529		-		0.529	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</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>	<b>Cost To Complete</b>	<b>Total Cost</b>	
BSP - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.234	Dec 2018	1.162	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBRN IS - ES S - milCloud support	MIPR	Various : Various	0.284	2.259	Dec 2018	1.841	Dec 2019	2.057	Dec 2020	-		2.057	Continuing	Continuing	0.000
JEM - ILS C - Training and Logistics Support	Various	Various : Various	0.000	1.009	Dec 2018	1.675	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 1&2 - ES S - Modernization	MIPR	Various : Various	1.211	0.000		0.704	Oct 2019	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	3.447	0.428	Feb 2019	0.134	Feb 2020	0.494	Feb 2021	-		0.494	Continuing	Continuing	0.000

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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>			4.942	3.930		5.516		2.551		-		2.551	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - 1- OTE S - FOT&E	MIPR	Various : Various	4.581	0.000		0.050	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- OTE S	MIPR	Various : Various	0.706	0.313	Dec 2018	0.185	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
<b>Subtotal</b>			5.287	0.313		0.235		0.000		-		0.000	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 C - Program Management Support	Various	Various : Various	0.000	0.000		0.402	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JEM - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.415	Dec 2018	0.479	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - PM/MS S - Program management	MIPR	Various : Various	2.178	0.387	Dec 2018	0.469	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
SSA - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.133	Feb 2019	0.042	Feb 2020	0.154	Feb 2021	-		0.154	Continuing	Continuing	0.000
<b>Subtotal</b>			2.178	0.935		1.392		0.154		-		0.154	Continuing	Continuing	N/A

	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
<b>Project Cost Totals</b>		25.216	14.039	16.111	3.234	-	3.234	Continuing	Continuing	N/A

**Remarks**

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 - CSG BD 9, 10	■																											
BSP - Final Operational Test and Evaluation - RDP 1							■																					
CBRN IS - Product Development	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
CBRN IS - Operational Assessments	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
CBRN IS - Total Package Fielding	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JEM Increment 2 - RDP 4			■	■																								
JEM Increment 2 - FD 3			■																									
JEM Increment 2 - FD 4							■																					
JEM Increment 2 - Govt DT / OT / V&V	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JEM Increment 2 - Modernization and Update	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
JEM Increment 2 - BD 4	■																											
JEM Increment 2 - BD 5			■																									
JEM Increment 2 - FOC Standalone		■																										
JEM Increment 2 - IOC Emerging Capabilities				■																								
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs							■	■																				
JWARN Increment 2 - Modernization and Update							■	■																				
JWARN Increment 2 - Product Development							■	■																				
SSA - Provide Information Assurance Site Compliance Testing	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 - Sustain Common Components products, process and services																												
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 - CSG BD 9, 10	2	2019	2	2019
BSP - Final Operational Test and Evaluation - RDP 1	3	2020	4	2020
CBRN IS - Product Development	1	2019	4	2025
CBRN IS - Operational Assessments	1	2019	4	2025
CBRN IS - Total Package Fielding	1	2019	4	2022
JEM Increment 2 - RDP 4	3	2019	4	2019
JEM Increment 2 - FD 3	3	2019	3	2019
JEM Increment 2 - FD 4	3	2020	3	2020
JEM Increment 2 - Govt DT / OT / V&V	1	2019	4	2020
JEM Increment 2 - Modernization and Update	1	2019	4	2020
JEM Increment 2 - BD 4	1	2019	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2020	4	2020
JWARN Increment 2 - Modernization and Update	1	2020	4	2020
JWARN Increment 2 - Product Development	1	2020	3	2020
SSA - Provide Information Assurance Site Compliance Testing	1	2019	4	2025
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2019	4	2025
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2019	4	2025
SSA - Sustain Common Components products, process and services	1	2019	4	2025

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> IS7 / <i>Information Systems (Op Sys Dev)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MB7: Medical Biological Defense (Op Sys Dev)	-	8.602	3.231	2.308	-	2.308	2.012	2.305	5.975	9.188	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

The project supports technology refresh of fielded medical diagnostic systems and associated capabilities (e.g., assays) that contribute to the layered medical defenses against biological warfare agent threats facing U.S. Forces in the field.

Efforts in this project include:

- (1) Next Generation Diagnostic System (NGDS)

The NGDS is a family of systems providing increments of diagnostic capabilities over time that address varied CBR threats across the different echelons of the Combat Health Support System. The mission of the NGDS is to provide CBR threat and infectious disease identification and Food and Drug Administration (FDA) cleared diagnostics to inform individual patient treatment and CBR situational awareness and disease surveillance. NGDS 1 improves diagnostic capabilities in deployable and laboratory-based combat health support units. NGDS 1 offers improved operational suitability and affordability over legacy systems by developing FDA cleared biological warfare agent (BWA) and infectious disease in vitro diagnostic (IVD) assays on an existing commercial diagnostic device with a well-established FDA regulatory history and pipeline of commercial non-BWA infectious disease diagnostic tests.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) NGDS 1	8.602	3.231	2.308
<b>Description:</b> System Upgrades & Support			
<b>FY 2020 Plans:</b> Continue development and upgrade of additional objective FDA cleared medical diagnostic assays. Complete development of additional assays and sample validation protocols to meet JBAIDS equivalence. Continue annual cyber security updates and management of hardware and software configurations.			
<b>FY 2021 Plans:</b> Continue development of additional assays and sample validation protocols. Continue annual cyber security updates and management of hardware and software configurations.			
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program	<b>Date:</b> February 2020
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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> MB7 / Medical Biological Defense (Op Sys Dev)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
Minor change due to routine program adjustments.			
<b>Accomplishments/Planned Programs Subtotals</b>	8.602	3.231	2.308

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

N/A

**Remarks**

**D. Acquisition Strategy**

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

The NGDS 1 program was a MS A to MS C - acquisition strategy, with MS C approval granted in Dec 2016 for limited production and fielding. NGDS 1 is replacing the legacy Joint Biological Agent Identification and Diagnostic System (JBAIDS) beginning in FY17. NGDS 1 Full Rate Production was approved in Aug 2018.

NGDS 2 will employ a family of systems approach to bridge identified capability gaps for man-portable diagnostics, immunoassay diagnostics, and chemical diagnostics systems. NGDS 2 continued the technology maturation and risk reduction of a man-portable diagnostic capability in FY18 and transitioned to engineering and manufacturing development phase in FY19. NGDS 2 initiated prototyping of a chemical diagnostic capability in FY18. Separate decisions will be utilized to proceed with further development and production for each capability, based on individual determinations of technology maturity to meet user requirements. Development efforts are cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings. NGDS 2 is broken out into NGDS 2 CHEMDx and NGDS 2 MPDS starting in FY21.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - NGDS 1 - HW C - Assay Development	C/CPFF	BioFire Dx : Salt Lake City, UT	14.159	2.676	Nov 2018	2.123	Dec 2019	0.458	Dec 2020	-		0.458	Continuing	Continuing	0.000
NGDS - HW C - Assay Development	MIPR	Battelle Memorial Institute : Aberdeen, MD	0.441	0.511	Nov 2018	0.000		0.127	Dec 2020	-		0.127	Continuing	Continuing	0.000
NGDS - HW C - Assay Development #2	MIPR	Various : Various	0.641	0.381	Jan 2019	0.000		0.150	Dec 2020	-		0.150	Continuing	Continuing	0.000
<b>Subtotal</b>			15.241	3.568		2.123		0.735		-		0.735	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	C/CPFF	BioFire Dx : Salt Lake City, UT	0.682	0.045	Jun 2019	0.150	Jun 2020	0.192	Dec 2020	-		0.192	Continuing	Continuing	0.000
<b>Subtotal</b>			0.682	0.045		0.150		0.192		-		0.192	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 - PM/MS C - ADMc Support	C/CPFF	Ology : Alachua, FL	1.126	1.117	Nov 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS S - Program Management (JPM) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	5.293	1.645	Jan 2019	0.213	Dec 2019	0.236	Dec 2020	-		0.236	Continuing	Continuing	0.000
NGDS - PM/MS C - Program Management (Dx) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.554	0.226	Nov 2018	0.162	Dec 2019	0.240	Dec 2020	-		0.240	Continuing	Continuing	0.000



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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
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

NGDS - System Upgrades & Support	[REDACTED]																											
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NGDS - System Upgrades & Support	1	2019	4	2025

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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> MC7 / Medical Chemical Defense (Op Sys Dev)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
MC7: Medical Chemical Defense (Op Sys Dev)	-	0.000	1.248	1.817	-	1.817	1.678	5.032	10.456	8.578	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 nerve agent treatment system that contribute to the layered medical defenses against chemical warfare agent threats facing U.S. Forces in the field.

The effort included in this project are:

- (1) Improved Nerve Agent Treatment System (INATS)
- (2) Improved Nerve Agent Treatment System Centrally Acting (INATS CA)
- (3) Alternative Autoinjector Manufacturer Capability (AUTOINJ)

(1) INATS - Soman Nerve Agent Pre-Treatment Pyridostigmine (SNAPP) is a modernization effort for Pyridostigmine Bromide (PB) requirements from the joint service users for the Food and Drug Administration (FDA) approved SNAPP product.

(2) INATS-CA advanced development provides a centrally-acting anticholinergic agent to increase survivability and decrease morbidity after exposure to toxic nerve agent threats. Scopolamine was selected for development after an extensive analysis of alternatives and review of data by the Science and Technology community. Added to the currently fielded system, the INATS-CA program will improve overall medical outcomes and will be utilized as both a vial for use at definitive care and a stand-alone auto-injector for use in the field.

(3) AUTOINJ consists of investigating an FDA approved alternative source(s), beyond the single current Department of Defense (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 fielded Antidote Treatment Nerve Agent Auto-injector (ATNAA) product, the oxime (2-PAM) and atropine in a dual chambered autoinjector. This program augments legacy autoinjectors, ATNAA, 2-PAM, and CANA by providing alternative commercial sources which include Dual Drug Delivery Device (D4), the atropine autoinjector, and anti-convulsant autoinjector.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>Title:</b> 1) Alternative Autoinjector Manufacturer Capability (AUTOINJ)	-	-	0.200
<b>Description:</b> Food and Drug Administration (FDA) Post-Marketing Commitments			

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**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Chemical and Biological Defense Program **Date:** February 2020

<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> MC7 / Medical Chemical Defense (Op Sys Dev)
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2019	FY 2020	FY 2021
<p><b>FY 2021 Plans:</b> Initiate Post-Marketing Commitments</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Minor change due to routine program adjustments. Atropine autoinjector is transitioning to pre-planned product improvement per FDA requirements.</p>			
<p><b>Title:</b> 2) INATS</p> <p><b>Description:</b> SNAPP - Shelf Life Modernization - Studies required by the FDA and/or users to modernize or upgrade medical chemical defense countermeasures.</p> <p><b>FY 2020 Plans:</b> Initiate studies on the FDA-approved Soman Nerve agent Pretreatment Pyridostigmine (SNAPP), a Pyridostigmine Bromide (PB) medical pre-treatment against nerve agent poisoning to upgrade its joint service utility and ensure its continued safety and efficacy.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred to another funding line. Effort transitions to INATS CA in FY21.</p>	-	1.248	-
<p><b>Title:</b> 3) INATS - CA</p> <p><b>Description:</b> Studies required by the FDA and/or users to modernize or upgrade medical chemical defense countermeasures.</p> <p><b>FY 2021 Plans:</b> Continue studies on the FDA-approved Soman Nerve agent Pretreatment Pyridostigmine (SNAPP), a Pyridostigmine Bromide (PB) medical pre-treatment against nerve agent poisoning to upgrade its joint service utility and ensure its continued safety and efficacy</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Program/project funding transferred from another funding line. Effort transitioned from INATS. Expecting an increase in costs due to higher number of samples that will be tested.</p>	-	-	1.617
<b>Accomplishments/Planned Programs Subtotals</b>	-	1.248	1.817

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

**Remarks**

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> MC7 / Medical Chemical Defense (Op Sys Dev)

**D. Acquisition Strategy**

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The Alternative Autoinjector Manufacturer Capability (AUTOINJ) will identify an alternative source(s) to develop and provide required FDA-approved autoinjector-delivered nerve agent antidote and treatment capabilities to the DoD. Currently, a single DoD source provides all of these capabilities.

The AUTOINJ effort leverages novel technologies and industrial base expansion in order to develop the autoinjector products. AUTOINJ uses contracts and Other Transactional Agreements (OTAs) in which the performer shall be responsible for conducting development and testing activities consistent with current Food and Drug Administration (FDA) regulations. The contractor shall sponsor the drug to the FDA and hold all approvals and/or licenses. Upon FDA approval, purchases for product sustainment will be made by the Defense Logistics Agency.

AUTOINJ (MC7) Post marketing commitments and requirements are anticipated as a result of the FDA approval and will be the responsibility of the contractor and the government.

IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

The INATS (MC4) program concludes as INATS in FY19.

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 centrally acting formulation development efforts, nonclinical toxicology and efficacy studies and clinical safety studies. In the Engineering and Manufacturing Development (EMD) phase, the Government will engage with commercial partner(s) to ensure that INATS CA development and manufacture is in accordance with Food and Drug Administration (FDA) regulations. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program for higher priorities, resulting in only the INATS CA component being pursued.

The INATS (MC7) line initiates in FY20 and transitions to INATS CA (MC7) in FY21. INATS (MC7) will support the modernization of Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP) using contract actions to extend operational shelf-life and generate data to expand storage temperature conditions.

IMPROVED NERVE AGENT TREATMENT CENTRALLY ACTING (INATS CA)

(MC5) 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 centrally acting formulation development efforts, nonclinical toxicology and efficacy studies and clinical safety studies. In the Engineering and Manufacturing Development (EMD) phase, the Government will engage with commercial partner(s) to ensure that development and manufacture is in accordance with Food and Drug Administration (FDA) regulations.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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> MC7 / Medical Chemical Defense (Op Sys Dev)
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<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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 - HW C - Post-Marketing Commitments	C/CPFF	TBD : N/A	0.000	0.000		0.000		0.200	Dec 2020	-		0.200	Continuing	Continuing	0.000
INATS - HW C - Non Clinical Studies PB	Various	TBD : N/A	0.000	0.000		1.248	Feb 2020	0.000		-		0.000	Continuing	Continuing	0.000
INATS CA - HW C - Shelf Life Modernization	C/CPFF	TBD : N/A	0.000	0.000		0.000		1.389	Dec 2020	-		1.389	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		1.248		1.589		-		1.589	Continuing	Continuing	N/A

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 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>			
INATS CA - Program Management (JPEO)	Various	JPEO Chem : Bio, Rad, and Nuc Defense (JPEO-CBRND)	0.000	0.000		0.000		0.141	Dec 2020	-		0.141	Continuing	Continuing	0.000
INATS CA - Program Management (MCS) Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.087	Dec 2020	-		0.087	Continuing	Continuing	0.000
<b>Subtotal</b>			0.000	0.000		0.000		0.228		-		0.228	Continuing	Continuing	N/A

<b>Project Cost Totals</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
	0.000	0.000	1.248	1.817	-	1.817	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2021 Chemical and Biological Defense Program			<b>Date:</b> February 2020
<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> MC7 / Medical Chemical Defense (Op Sys Dev)	

	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 - Post-Marketing Commitments																												
INATS - SNAPP Shelf-Life Modernization																												
INATS CA - SNAPP Shelf Life Modernization																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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> MC7 / <i>Medical Chemical Defense (Op Sys Dev)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AUTOINJ - Post-Marketing Commitments	1	2021	4	2023
INATS - SNAPP Shelf-Life Modernization	2	2020	4	2020
INATS CA - SNAPP Shelf Life Modernization	1	2021	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program										<b>Date:</b> February 2020		
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
TE7: Test & Evaluation (Op Sys Dev)	-	6.179	5.403	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.582
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) and BioTesting Division (BTD) Chemical Biological Center (CBC) at Dugway Proving Ground (DPG), a Major Range and Test Facility Base (MRTFB), in support of their Chemical and Biological (CB) test mission.

Efforts included in the project are:

- (1) BioTesting Division T&E Upgrade (BTD UPGRADE)
- (2) T&E Upgrades (T&E UPGRADE)

BTD UPGRADE supports the MRTFB test mission of the BioTesting Division (BTD) Chemical Biological Center (CBC) at DPG through instrumentation revitalization and technology upgrades to aging and obsolete equipment. These efforts maintain readiness at the BTD, which is the MRTFB's only laboratory equipped to test with aerosolized biosafety level-3 (BSL-3) agents. The BTD test mission requires cutting-edge biological laboratory and field testing capabilities to ensure the ability of the Department of Defense to test state-of-the-art materiel under development against known and emergent biological threats. Essential instrumentation requiring periodic revitalization and modernization due to technological obsolescence includes dissemination, referee, analytical, and lab and field instrumentation/equipment (e.g. field fluorescence aerosol particle sizing, next generation genomic sequencing, time of flight mass spectrometer, and lab entry control system upgrades).

The T&E Upgrade effort supports upgrades to equipment for field testing, the major test chambers Materiel Test Facility (MTF), and the Combined Chemical Test Facility (CCTF). Field test equipment includes all dissemination and field referee equipment and will include all upgraded test grid equipment transitioned from advanced development. The MTF houses chambers and fixtures for chemical agent and non-traditional agent (NTA) testing, including the secondary containment modules (SCMs) and chemical agent vapor (CAVs) chambers. The Combined Chemical Test Facility (CCTF) is a laboratory campus that houses labs and chambers for chemical agent and non-traditional agent testing. Laboratories are equipped with chemical analytical equipment, including a nuclear magnetic resonance (NMR) spectrometer, gas chromatographs (GC), GC-mass spectrometers (GC-MS), MS triple quads, Miniature Chemical Agent Monitoring System (MINICAMS), and liquid chromatographs MS (LCMS). The majority of the laboratory hood space at WDTC is in the CCTF. The CCTF houses test fixtures such as the small item decontamination (SID) fixture, mask, boot and glove, filter and swatch test fixtures.

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

<b>Title:</b> 1) BTD UPGRADE	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<b>FY 2020 Plans:</b>	0.885	0.757	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p>Continues to provide instrumentation and equipment to BTD-CBC, in support of the CB Defense mission. Continues to provide for BSL-3 biological laboratory equipment for the Lothar Salomon Test Facility (LSTF) and Baker Lab. Provides for enhancement of the aerosol biological capability challenging detection systems under test. Provides BSL-3 suite access control system, enhances field and laboratory aerosol referee capability, Containment Aerosol Chamber (BSL-3) chamber steam sterilizer procurement, and other technology upgrades to laboratory and field instrumentation.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.</p>			
<p><b>Title:</b> 2) WDTC - MRTFB</p> <p><b>Description:</b> Major Test Chambers (MTF and Building 4165)</p> <p><b>FY 2020 Plans:</b> Continue modernization in the chambers to include: (a) Enhancements of an aerosol generation and sampling capability; (b) Additional upgrades to agent surety monitor and analytical instrumentation; (c) Enhancement of TIC detection; and (d) Expanded NTA test and detection capability.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.</p>	1.059	0.998	-
<p><b>Title:</b> 3) WDTC - MRTFB</p> <p><b>Description:</b> CB Test Grid</p> <p><b>FY 2020 Plans:</b> Continue modernization efforts to 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 provide near real time data analysis and rapid test adaptation to minimize costs and increase the effectiveness of field testing.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.</p>	1.324	1.132	-
<p><b>Title:</b> 4) WDTC - MRTFB</p>	2.911	2.516	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>
<p><b>Description:</b> Combined Chemical Test Facility (CCTF)</p> <p><b>FY 2020 Plans:</b> Provide continued revitalization and upgrade of existing instrumentation and equipment at the CCTF at WDTC in support of their chemical test mission. Modernization will result in improved test fixtures which will reduce risk to personnel and provides improved test capabilities. Continue efforts to enhance NTA test capability in these fixtures.</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Defense-Wide Review (DWR): The Chemical Biological Defense Program FY 2021 funding request was reduced to account for program being restructured.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	6.179	5.403	-

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

N/A

**Remarks**

**D. Acquisition Strategy**

BIO TEST BRANCH T&E UPGRADE (BTB UPGRADE)

The BioTesting Division Test and Evaluation Range Instrumentation/Technology Upgrades program provides for technical upgrades to BioTesting Division (Chemical Biological Center) capabilities for Biological testing of DoD CB materiel, and biological detection systems from concept through production. Technical and Facility upgrades will utilize full and open competition as appropriate through Mission Installation Contracting Command, Army Contracting Command, Military Interdepartmental Purchase Requests, and other procurement resources. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program, within the Chemical Biological Defense Program (CBDP), for higher priorities.

T&E RANGE INSTRUMENT/TECH UPGRADE (T&E UPGRADE)

The Test and Evaluation Range Instrumentation/Technology Upgrades program provides for technical upgrades to WDTC capabilities for Chemical and Biological testing of DoD CB materiel, weapons, and weapons systems from concept through production. Upgrades will utilize Military Interdepartmental Purchase Requests (MIPR) and contracts. In FY21 and beyond, the Defense-Wide Review (DWR) reduced this program, within the Chemical Biological Defense Program (CBDP), for higher priorities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Chemical and Biological Defense Program** **Date:** February 2020

<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)
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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			
BTB UPGRADE - OTHT S - T&E Upgrade	C/FFP	Various : Various	0.925	0.885	Jun 2019	0.757	May 2020	0.000		-		0.000	0.000	2.567	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC Major Test Chambers (MTF and Building 4165)	MIPR	Various : Various	3.743	1.058	Feb 2019	0.998	Feb 2020	0.000		-		0.000	0.000	5.799	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC CB Test Grid	MIPR	Various : Various	1.352	1.324	Feb 2019	1.132	Feb 2020	0.000		-		0.000	0.000	3.808	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC CCTF	MIPR	Various : Various	0.490	1.076	Feb 2019	2.516	Feb 2020	0.000		-		0.000	0.000	4.082	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - CCTF Chemical Laboratory Fume Hoods	MIPR	Various : Various	2.516	1.836	Feb 2019	0.000		0.000		-		0.000	0.000	4.352	0.000
<b>Subtotal</b>			9.026	6.179		5.403		0.000		-		0.000	0.000	20.608	N/A
<b>Project Cost Totals</b>			9.026	6.179		5.403		0.000		-		0.000	0.000	20.608	N/A

**Remarks**



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Chemical and Biological Defense Program		<b>Date:</b> February 2020
<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)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
BTB UPGRADE - LSTF Instrumentation & Equip Upgrades, CBC	1	2019	4	2020
T&E UPGRAD - Modernization of Major Test Chambers, WDTC	1	2019	4	2020
T&E UPGRAD - Revitalize & Upgrade Instrumentation & Equipment at Combined Chemical Test Facility, WDTC	1	2019	4	2020
T&E UPGRAD - Enhance Instrumentation & Equipment at Chemical Biological (CB) Test Grids, WDTC	1	2019	4	2020

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