Department of Defense
Fiscal Year (FY) 2020 Budget Estimates

March 2019

Chemical and Biological Defense Program

Defense-Wide Justification Book Volume 4 of 5

Research, Development, Test & Evaluation, Defense-Wide

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Table of Volumes

Volume 4 Table of Contents

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Chemical Biological Defense Program Overview

The threat from chemical, biological, radiological, and nuclear (CBRN) weapons is growing as state and non-state actors are increasingly willing to use these type of weapons of mass destruction (WMD) for assassinations (Russia and North Korea) or to achieve asymmetric advantage (Syria and ISIS in Iraq). The threat continues to evolve as barriers to acquiring WMD decrease due to rapid advances in biotechnology and the relative ease of sharing these technologies.

Recent Presidential guidance directs strengthening defenses against WMD at home and abroad. The National Defense Strategy (NDS) recognizes the threat of WMD and prioritizes efforts to prevent the proliferation of WMD materials, defend the homeland from WMD threats, and manage the consequences of WMD attacks. The Chemical and Biological Defense Program (CBDP) is a key enabler to the NDS pillar to "Build a more lethal force" and through its activities and collaborations with interdepartmental, interagency and international partners the program supports the NDS pillar to "Strengthen Alliances".

The lethality of the Joint Force and its ability to continue the mission depends on the warfighter's ability to prepare for, prevent, protect, respond to, mitigate, and recover from the effects of WMD use. The CBDP provides materiel solutions as part of an integrated and layered capability to enable Countering WMD (CWMD) missions ranging from combat operations to DoD support to domestic incident prevention and response. This Fiscal Year 2020 President's Budget Request includes $1.40 billion aligned against the highest CBRN-defense priorities for the Department, Joint Service, and Combatant Commands to improve near-term Joint Force readiness and modernize the force over the long term.

Budget Overview

This budget request supports the NDS and the DoD Strategy for CWMD and advances the following areas:

- Situational Awareness (NDS Pillar: Build a More Lethal Force) - Improving tactical and operational commanders' decisions by developing and fielding better detection and identification capabilities to conduct CBRN reconnaissance, surveillance, and site exploitation missions. Developmental efforts focus on increasing detector accuracy, range, effectiveness, ensuring that detector data integrates seamlessly with other non-CBRN sensor systems and relevant information systems, and integration of sensors onto Service-fielded unmanned platforms.
- Protection (NDS Pillar: Build a More Lethal Force) - Enhancing mission performance while providing effective protection against current and emerging threats by rapidly developing and fielding modernized protective capabilities. Developmental efforts focus on advances in materials and systems engineering to enhance protective properties against a broader array of threats while reducing

CWMD operational challenges and logistical burdens. Modular and customizable solutions will be effective against a broad range of challenges in varied environments.

- Hazard Mitigation (NDS Pillar: Build a More Lethal Force) - Preserving combat power by developing and fielding systems that mitigate exposure to CBRN 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 decontaminate applicability to CB hazards, while minimizing harm to individuals, equipment, and platforms.
- Medical Countermeasures (NDS Pillar: Build a More Lethal Force) - Improving delivery of medical countermeasures (MCMs) to the warfighter by enhancing development with 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 validated biological threat agents (bacteria, toxins, and viruses), emerging infectious disease, in addition to traditional and non-traditional chemical agents.
- Prevent Surprise (NDS Pillar: Build a More Lethal Force) - Reducing the risk from emerging threats resulting from advances in biotechnology and the increased proliferation of WMD and enablers. Efforts focus on accelerating characterization and early assessment of possible threats by leveraging advances in biotechnology and artificial intelligence.

FY20 Budget Request Highlights

- The FY 2020 Research, Development, Test and Evaluation (RDT&E) budget request of $1,052 Million supports key efforts including:
  - $249 Million supporting RDT&E efforts advancing environmental (detectors) and medical diagnostic capabilities providing enhanced situational awareness of traditional and non-traditional chemical threats, as well as traditional and emerging biological threats.
  - $230 Million to continue support of research and development of medical countermeasures (MCMs) vaccines and therapeutics addressing high-priority biological threats.
  - $113 Million to continue support of research and development of medical countermeasures focused on protecting and treating against traditional and non-traditional chemical agents.
  - $103 Million to support critical chemical and biological defense research, development, and test infrastructure and operations.
  - $79 Million supporting basic research and threat agent sciences advancing fundamental knowledge and experimental research in the life and physical sciences.
  - $72 Million supporting biosurveillance, warning & reporting, decision support, and modeling and simulation capabilities.

- $50 Million supporting MCM platform and manufacturing technologies to streamline and accelerate MCM delivery by reducing developmental risk. Efforts center on leveraging and sustaining the DoD's Advanced Development and Manufacturing (ADM) capability.
- $63 Million supporting RDT&E for personnel protection, collective protection and hazard mitigation capabilities against traditional and non-traditional chemical threats as well as traditional and emerging biological threats.
- $24 Million supporting concepts development, technology demonstrations, and experimentation capability demonstrations of enhanced military operational capability for technologies and equipment.

- The FY 2020 Procurement budget request of $351 Million supports key efforts including:
  - $83 Million to procure modernized respiratory and ocular protection for ground and air forces.
  - $55 Million to procure modernized Analytical Laboratory Systems to enhance and sustain the National Guard – Weapons of Mass Destruction Civil Support Teams (WMD-CST) analytical capabilities for defense support to civil authorities.
  - $53 Million to procure CBRN Dismounted Reconnaissance Sets, Kits, and Outfits (DR SKO) which allows warfighters to perform CBRN dismounted reconnaissance, surveillance, and site assessment of WMD suspect areas not accessible by traditional CBRN reconnaissance-mounted platforms.
  - $36 Million to procure modernized Collective Protection capabilities (Joint Expeditionary Collective Protection, CB Protective Shelters and CB Aircraft Survivability Barrier).
  - $25 Million to procure Joint Biological Agent Decontamination Systems providing the capability to conduct biological agent decontamination of the interior and exterior of aircraft and vehicle platforms.
  - $17 Million to procure Enhanced Maritime Biological Detectors which provide the U.S. Navy improved detection/identification capabilities, decreased operational costs, and increased reliability and maintainability for detection of biological threats.
  - $13 Million to procure protective ensembles supporting enhanced protection for the Joint Force, to include Special Purpose Units.

Summary

The proliferation of WMD is among the greatest challenges facing the United States, and improving our ability to counter WMD is a top priority of the United States of America. Accordingly, the CBDP continues to develop capabilities as part of an integrated, layered defense to strengthen the Joint Force's ability to prevent, protect against, respond to, mitigate and recover from CBRN threats and effects. This budget enables the CBDP to support the Joint Force to ensure that they are equipped to complete missions in CBRN environments, preserving the security and freedom of our nation.

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Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

25 Feb 2019

Appropriation	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Research, Development, Test & Eval, DW	1,056,761	998,721		998,721
Total Research, Development, Test & Evaluation	1,056,761	998,721		998,721

R-120PB: FY 2020 President's Budget (Published Version), as of February 25, 2019 at 12:59:07

Department of Defense
FY 2020 President's Budget
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(Dollars in Thousands)

25 Feb 2019

Appropriation	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Research, Development, Test & Eval, DW	1,052,406				1,052,406
Total Research, Development, Test & Evaluation	1,052,406				1,052,406

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Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Basic Research	43,769	42,103		42,103
Applied Research	199,466	192,674		192,674
Advanced Technology Development	141,242	142,826		142,826
Advanced Component Development And Prototypes	135,322	115,886		115,886
System Development And Demonstration	368,151	358,608		358,608
Management Support	125,179	102,883		102,883
Operational System Development	43,632	43,741		43,741
Total Research, Development, Test & Evaluation	1,056,761	998,721		998,721

Summary Recap of FYDP Programs				
Research and Development	1,056,761	998,721		998,721
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Summary Recap of Budget Activities	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Basic Research	45,238				45,238
Applied Research	202,587				202,587
Advanced Technology Development	172,486				172,486
Advanced Component Development And Prototypes	83,662				83,662
System Development And Demonstration	384,047				384,047
Management Support	110,363				110,363
Operational System Development	54,023				54,023
Total Research, Development, Test & Evaluation	1,052,406				1,052,406
Summary Recap of FYDP Programs					
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25 Feb 2019

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

Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
7	0601384BP	Chemical and Biological Defense Program	01	43,769	42,103		42,103	U
	Basic Research			43,769	42,103		42,103	
15	0602384BP	Chemical and Biological Defense Program	02	199,466	192,674		192,674	U
	Applied Research			199,466	192,674		192,674	
42	0603384BP	Chemical and Biological Defense Program - Advanced Development	03	141,242	142,826		142,826	U
	Advanced Technology Development			141,242	142,826		142,826	
76	0603884BP	Chemical and Biological Defense Program - Dem/Val	04	135,322	115,886		115,886	U
	Advanced Component Development And Prototypes			135,322	115,886		115,886	
125	0604384BP	Chemical and Biological Defense Program - EMD	05	368,151	358,608		358,608	U
	System Development And Demonstration			368,151	358,608		358,608	
157	0605384BP	Chemical and Biological Defense Program	06	105,122	102,883		102,883	U
158	0605502BP	Small Business Innovative Research - Chemical Biological Def	06	20,057				U
	Management Support			125,179	102,883		102,883	
202	0607384BP	Chemical and Biological Defense (Operational Systems Development)	07	43,632	43,741		43,741	U
	Operational System Development			43,632	43,741		43,741	
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		Applied Research		202,587				202,587	
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		Advanced Technology Development		172,486				172,486	
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		Advanced Component Development And Prototypes		83,662				83,662	
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		System Development And Demonstration		384,047				384,047	
157	0605384BP	Chemical and Biological Defense Program	06	110,363				110,363	U
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		Management Support		110,363				110,363	
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Master Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0400: Research, Development, Test & Evaluation, Defense-Wide

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Master Program Element Table of Contents (Alphabetically by Program Element Title)

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	43.769	42.103	45.238	-	45.238	45.369	45.385	45.384	45.376	Continuing	Continuing
LF1: *CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)*	-	27.312	26.815	29.730	-	29.730	29.813	29.824	29.823	29.818	Continuing	Continuing
PS1: *CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)*	-	16.457	15.288	15.508	-	15.508	15.556	15.561	15.561	15.558	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. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	43.898	42.103	45.311	-	45.311
Current President's Budget	43.769	42.103	45.238	-	45.238
Total Adjustments	-0.129	0.000	-0.073	-	-0.073
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.129	-			
• SBIR/STTR Transfer	0.000	-			
• Other Adjustments	0.000	-	-0.073	-	-0.073

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 1: *Basic Research*	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*

Change Summary Explanation

Funding: FY18 (-$0.129M): Reprogrammings to support core competencies at the U.S. Army Medical Research Institute for Infectious Diseases and CBDP Defense Finance and Accounting System transactions.

FY20 (-$0.073M): Program adjustments to balance overall portfolio efforts.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	Project (Number/Name) LF1 / *CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
LF1: *CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)*	-	27.312	26.815	29.730	-	29.730	29.813	29.824	29.823	29.818	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)	FY 2018	FY 2019	FY 2020
Title: 1) Life Sciences	27.312	26.815	29.730
Description: Focuses on fundamental efforts to understand living systems' responses to biological or chemical agents, to support detection, protection, diagnostics, and medical treatment. ***FY 2019 Plans:*** - Blood-brain barrier - Evaluate nanoparticle and antivirals neuro-protective agents in mice. Continue development of particle based delivery systems for transport of macromolecule antidotes across the blood-brain barrier. - Viral pathogenesis - Expand modeling of viral structures to second pathogen and begin correlation of data in mouse models. - Develop delivery molecules and begin to assess viral protein and virus like particle variants for multi-strain protective antibody. - Biomarkers - Perform optimization and evaluation of microneedle microfluidics and establish biomarker validation for various threats. - Enabling Science - Continue to characterize a family of unique double-stranded RNA molecules and begin to collect biomarkers that can indicate infection and give information on the type of infection. - Continue developing robust genetic control architectures for guidance of antimicrobials against bio threats. - Chemical scavengers - Assess the expression of lung alveoli cellular inflammatory receptors. Assess whether efflux pump inhibitors alter the access of neurological agents in the brain. Prepare antibody-targeted nanoparticles loaded with oxime. - STEM: Support 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. Programs ending in FY19: -Reservoir host - Use developed inflammatory response models to elucidate function of filovirus proteins in bats. Transfer data to larger animal model program and conclude efforts.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	**Project (Number/Name)** LF1 / *CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Persisters - Identify potential drug targets to enhance antibiotic efficacy from developed data. Transfer data to larger antimicrobial resistance program and conclude efforts. - In vitro glycosylation - Develop tools that can identify glycosylation patterns and corresponding therapeutic proteins for potential future therapeutics. Transfer data to larger antimicrobial resistance program and conclude efforts. - Bacterial resistance - Develop diagnostic tools for early and rapid identification of resistant pathogens based on gene amplification changes. Validate genomic patterns of resistance with secondary pathogens. ***FY 2020 Plans:*** - 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 BBB transport. - Viral pathogenesis - Continue to expand 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 - Complete a characterize a family of unique double-stranded RNA molecules and evaluate collected biomarkers that can indicate infection and give information on the type of infection. 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	27.312	26.815	29.730

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	**Project (Number/Name)** LF1 / *CHEMICAL/BIOLOGICAL DEFENSE - LIFE SCIENCES (BASIC RESEARCH)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CB2: *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	74.565	67.994	77.803	-	77.803	77.799	78.285	82.463	83.596	Continuing	Continuing
• NT2: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	51.625	53.720	52.902	-	52.902	50.111	52.385	52.377	52.368	Continuing	Continuing
• TM2: *TECHBASE MED DEFENSE (APPLIED RESEARCH)*	73.276	70.960	71.882	-	71.882	76.953	78.329	75.839	75.928	Continuing	Continuing
• CB3: *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	16.878	21.698	16.798	-	16.798	22.039	22.538	22.833	21.682	Continuing	Continuing
• NT3: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	20.781	22.749	24.180	-	24.180	30.295	31.085	31.076	31.071	Continuing	Continuing
• TM3: *TECHBASE MED DEFENSE (ATD)*	92.231	88.188	120.526	-	120.526	128.035	127.992	122.006	122.553	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 1	R-1 Program Element (Number/Name) PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	Project (Number/Name) PS1 / *CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
PS1: *CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)*	-	16.457	15.288	15.508	-	15.508	15.556	15.561	15.561	15.558	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project (PS1) advances fundamental scientific knowledge in physical science areas that include chemistry, physics, materials science, environmental sciences, and nanotechnology that could potentially lead to transformational CB defensive capabilities enhancing Warfighter performance and safety.

Individual efforts in this project include:
- Research results in physics, chemistry, and materials sciences that have potential application in point and remote detection, diagnostics, as well as protection and decontamination.
- Surface and environmental sciences focus on the study of physical and chemical properties and phenomena of interactions, especially with regard to Non-Traditional Agents (NTAs), that seek to improve capabilities such as detection, protection, and decontamination.
- Research in nanotechnology and nanoscale sciences, such as nanoelectromechanical systems, molecular motors, nano-mechanical resonance sensing, and nano-meter imaging, has potential application across CB capability areas to provide significant enhancement by 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)	FY 2018	FY 2019	FY 2020
Title: 1) Physical Sciences	16.457	15.288	15.508
Description: Focuses on fundamental scientific phenomena including chemistry, physics, materials science, environmental science, and nanotechnology.			
FY 2019 Plans: - Continue to examine the impact of processing parameters in designing large scale membranes, which respond to multiple CB threats via deactivation and conformation change to enable novel means of protection and minimization of thermal burden. - Continue designing and synthesizing novel decontamination options that are broadly applicable to multiple chemicals or biologicals and are less harmful to equipment. - Continue to investigate the impact of morphology on approaches to mitigate chemical and biological threats on CB relevant substrates such as fibers and yarns. - Continue to investigate the impact of composition on structure and activity of materials to mitigate chemical and biological threats on CB relevant substrates. - Continue to study fundamental mechanisms between CB threats and surfaces at ambient pressure in order to elucidate its impact on reaction mechanisms between CB threats and state-of-the-art and novel CB mitigating surfaces.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	**Project (Number/Name)** PS1 / *CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue investigation of ecological and environmental drivers of Burkholderia pseudomallei virulence and persistence using multiplexed barcoded high throughput sequencing. - Continue to examine biomarkers from interstitial fluid and begin microneedle biosensor development to identify protein analytes. Optimize catalytic polyelectrolyte and metal organic framework structures for hydrolysis or oxidation of toxic agents. Evaluate and model self-decontaminating catalytic properties of materials for further testing against real agents. - Continue to assess and evaluate the efficacy of short chain fatty acids as a means of inactivating B. anthracis vegetative cells, endospores, and other microorganisms under a variety of environmental conditions and surfaces. - Continue to investigate the elementary reactions, fundamental process parameters, and material mechanisms of a new means of neutralizing chemical warfare agents using a single-step, continuous supercritical water oxidation platform. ***FY 2020 Plans:*** - Environmental Availability - Determine genetic changes that occur when bacteria enters 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, and complete the proof of concept for chemical sensing using these components. - Chemical Reactivators - Determine mechanistic and structural studies of the aged reactivator complexes. - Multifunctional Materials - Reproduce synthesis to target a polymer composition containing the desired volume fraction of polymer blocks as required for successful and stable membrane generation. - Catalysts for CB Defense- Combined experimental data and modeling data to determine mechanism of the degradation. Synthesize metal organic framework (MOF) hybrids and quantify effects of interferent molecules. - Biomimetic - Evaluate molecules for bioremediation conditions that mimic field conditions. Begin to screen catalysts in libraries to validate chemistry. - Novel Destruction - Continue to optimize chemical surrogates and design modifications of lab reactor for use with threat agents. Complete system requirement for the field prototypes ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	16.457	15.288	15.508

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 1	**R-1 Program Element (Number/Name)** PE 0601384BP / *CHEMICAL/BIOLOGICAL DEFENSE (BASIC RESEARCH)*	**Project (Number/Name)** PS1 / *CHEM/BIO DEFENSE - PHYSICAL SCIENCES (BASIC RESEARCH)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CB2: *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	74.565	67.994	77.803	-	77.803	77.799	78.285	82.463	83.596	Continuing	Continuing
• NT2: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	51.625	53.720	52.902	-	52.902	50.111	52.385	52.377	52.368	Continuing	Continuing
• TM2: *TECHBASE MED DEFENSE (APPLIED RESEARCH)*	73.276	70.960	71.882	-	71.882	76.953	78.329	75.839	75.928	Continuing	Continuing
• CB3: *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	16.878	21.698	16.798	-	16.798	22.039	22.538	22.833	21.682	Continuing	Continuing
• NT3: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	20.781	22.749	24.180	-	24.180	30.295	31.085	31.076	31.071	Continuing	Continuing
• TM3: *TECHBASE MED DEFENSE (ATD)*	92.231	88.188	120.526	-	120.526	128.035	127.992	122.006	122.553	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	199.466	192.674	202.587	-	202.587	204.863	208.999	210.679	211.892	Continuing	Continuing
CB2: *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	-	74.565	67.994	77.803	-	77.803	77.799	78.285	82.463	83.596	Continuing	Continuing
NT2: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	-	51.625	53.720	52.902	-	52.902	50.111	52.385	52.377	52.368	Continuing	Continuing
TM2: *TECHBASE MED DEFENSE (APPLIED RESEARCH)*	-	73.276	70.960	71.882	-	71.882	76.953	78.329	75.839	75.928	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).

- NTA Defense (NT2): consolidation of 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

- 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: United States Army Edgewood Chemical Biological Center (ECBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 2: *Applied Research*	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

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.

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

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	201.053	192.674	194.061	-	194.061
Current President's Budget	199.466	192.674	202.587	-	202.587
Total Adjustments	-1.587	0.000	8.526	-	8.526
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	2.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	0.715	-			
• SBIR/STTR Transfer	-4.302	-			
• Other Adjustments	0.000	-	8.526	-	8.526

Change Summary Explanation

Funding: FY18 (+$2.000M): Congressional add for program increase to Chemical Biological Defense (CB2).
FY18 (+$0.715M): Reprogramming to support therapeutics projects.
FY18 (-$4.302M): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+$8.526M): Threat Agent Science funding increased to expand threat characterization and assessments to minimize surprise from emerging and advanced CBRN threats.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	Project (Number/Name) CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CB2: *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	-	74.565	67.994	77.803	-	77.803	77.799	78.285	82.463	83.596	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project CB2 provides physical science applied research to develop future, multi-disciplinary, and multi-functional capabilities in life sciences, physical sciences, environmental sciences, mathematics, cognitive sciences, and engineering. Efforts in this project support the seamless integration of state-of-the-art-technologies into a collection of systems across the spectrum of capabilities required to support chemical and biological defense missions.

Capability areas in this project include:
- Protection 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, operational effects and risk assessment, and systems performance modeling.
- Warning and reporting focuses on non-traditional detection methods to provide indications of chemical and biological exposure risk.
- Biosurveillance provides methodologies to integrate open source data into advanced warning systems.
- Threat agent science is devoted to characterizing threat agents and the hazards they present in terms of agent fate in the environment, toxicology, and pathogenicity, and focuses on the horizontal integration of CB defensive technologies in support of the Joint Services.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Material Contamination Mitigation	3.126	7.180	6.823
Description: Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort. ***FY 2019 Plans:*** - Continue chemical hot air decontamination effort to address sensitive equipment, platform interior, and aircraft chemical warfare agent decontaminant needs and explore using aerosol decontaminants to enhance the process. - Continue coatings research to understand chemical agent resistance coatings (CARC) and mechanisms of agent absorption and also investigate potential new coatings to improve agent resistance of CARC. - Continue Wide Area Decontamination of Bacillus anthracis project, focused on agrochemical approaches and conduct outdoor demonstration. - 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.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Complete 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. - Continue effort to examine how decontamination technologies perform on field assets when contaminated with other than Chemical Agent Standard Analytical Reference Material (CASARM) (laboratory quality/pure) chemical agents. - Continue efforts to develop/enhance agent mapping (disclosure/assurance) technologies. Initiate effort to develop Wide Area Decontamination of chemical warfare agents capability/system. ***FY 2020 Plans:*** - Complete optimization of chemical hot air decontamination process. 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. - Continue evaluating CARC and potential temporary or permanent coatings to potentially decrease logistical burden of decontamination of CARC coated equipment. - Continue Wide Area Decontamination (chemical) efforts to examine analytical methods and test procedures for concrete, asphalt and soil for decontamination of chemical agents. - 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. - Continue efforts to develop/enhance agent mapping (disclosure/assurance) technologies. - Continue efforts to examine impacts of in operando conditions on the hazard mitigation process to inform design to future (next generation) decontamination strategies. - Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to fact of life change in the program/project.			
Title: 2) Respiratory and Ocular Protection ***Description:*** Description: 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. ***FY 2019 Plans:*** - Continue to assess improved oxygen and carbon dioxide removal technologies. - Continue to evaluate and assemble improved sensor technologies and control systems into Self-Contained Breathing Apparatus (SCBA) platforms.	3.162	2.464	1.707

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to coordinate with percutaneous protection whole ensemble developmental efforts that will extend the available operational time and improve interfaces with tactical equipment. - Continue efforts that integrate emerging respirator and helmet filtration components and technologies. - Continue to develop and validate flexible and stretchable materials for tactical all hazard protective ensemble applications. ***FY 2020 Plans:*** - Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents. - Continue to explore technologies for oxygen storage and CO2 removal including materials and components of this and integrate into Full Spectrum Respiratory Protection System (FSRPS). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to fact of life change in the program/project.			
Title: 3) Percutaneous Protection	6.159	4.120	3.152
Description: 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. ***FY 2019 Plans:*** - Continue the process to mount compounded materials onto fabrics for protection. - Continue to conduct fiber and yarn analysis. - Continue to develop knit and woven samples for evaluation. - Develop respirator and helmet integration, develop and qualify flexible and stretchable materials for all hazard use. Fabricate and test hood/mask interface concepts, perform whole system agent tests. - Develop mechanisms at scale, and finalize proof of principle responsive materials. Determine usefulness of metal organic frameworks and other materials for use in fabrics for protective ensembles. - Conduct warfighter demonstration and assessment 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. ***FY 2020 Plans:*** - Continue to mount compounded materials onto fabrics for protection. - Continue to conduct fiber and yarn analysis. - Continue to develop knit and woven samples and reactive stretchy fabrics for evaluation. - Continue efforts to scale and evaluate membrane technologies for responsive materials to chemical and biological agents.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 4) Expeditionary Collective Protection ***Description:*** Develop new technologies for soldiers to determine the remaining chemical vapor service life of their CWA filters. ***FY 2019 Plans:*** - Continue field testing and sampling of Guard Bed and Residual Life Indicator (RLI) filters. ***FY 2020 Plans:*** - Complete field testing and sampling of Guard Bed and RLI filters at fixed sites and provide final report. - Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	1.343	0.370	0.897
Title: 5) Personnel Contamination Mitigation ***Description:*** 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. ***FY 2019 Plans:*** - Continue personnel decontamination efforts to enhance current processes (kinetics, dwell time, mechanics, etc.) and support mass casualty personnel decontamination warfighter operations to increase throughput and decrease logistics and burden on warfighters, including efficacy studies associated with the homeland defense mission. ***FY 2020 Plans:*** - 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. - Identify new catalytic materials that are capable of reacting, sorbing, and neutralizing chemical and biological agents. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	1.350	0.370	1.365
Title: 6) Biosurveillance	9.680	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact, and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools. This program is transferring to CB2 (Chemical Biological Defense) Threat Surveillance in FY19.			
Title: 7) Detection Sensor Technologies	26.252	23.270	23.546
Description: Focus of this effort is to develop capabilities to detect and identify chemical and biological threats. This activity can include development of point, remote, or standoff sensors as appropriate, to address both conventional and non-traditional chemical and biological threats. These efforts are being developed to further the detection capability for early warning of contamination exposure to the warfighter. ***FY 2019 Plans:*** - Continue concept and technology development for biological and chemical threat early warning detection to include distributed biological reconnaissance capabilities along with the ability to reduce false alarms in a highly complex and chemical saturated environment. - Continue development of detection capabilities for identifying genomic editing events. - Initiate the development of exploring sensing approaches to provide unattended monitoring of perimeters for rapid defensive positioning to enable early indication of airborne chemical threats. - Continue the development of sensors for mobile applications, including development for unmanned systems. - Initiate a program to investigate an automated man-out-of-loop remote biological collection and detection system. ***FY 2020 Plans:*** - Complete development of a man worn environmental sensor for detecting exposure to chemical hazards. - Continue concept and technology development for biological and chemical threat early warning detection to include distributed biological reconnaissance capabilities along with the ability to reduce false alarms in a highly complex chemical environment. - Continue development of detection capabilities for identifying genomic editing events. - Continue the development of sensors for mobile applications, including development for unmanned systems. - Continue development of detection technologies for an automated man-out-of-loop remote biological collection and detection capability.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Initiate development of detection technologies to provide unattended monitoring for early indication of airborne chemical threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 8) Warning and Reporting ***Description:*** Develop non-traditional detection methods to provide indications of chemical and biological exposure risk. 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. ***FY 2020 Plans:*** - 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. - Investigate individual versus group informatics for earlier warning. - Explore DNA storage, recording, and monitoring for longitudinal detection application. - Explore the use of augmented reality to provide chemical and biological threat situational awareness in head-mounted visual displays. - Develop tools that provide information forward to the tactical commander. Tools planned for development include a sensor placement tool and a source term estimation algorithm that are capable of producing results utilizing the computing resources available on the tactical devices. - Research machine learning approaches to develop quicker running models. - Investigate automated approaches using artificial intelligence and machine learning to detect signals and provide earlier warning of chemical and biological threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. This program subsumes CB2 Threat Surveillance in FY20.	-	-	9.416
Title: 9) Hazard Prediction ***Description:*** 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. ***FY 2019 Plans:***	4.801	7.253	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue development of coupled indoor and outdoor dispersion models for enhanced hazard prediction in urban environments. Execute a field trial to collect validation data for coupled indoor and outdoor dispersion models and conduct sample analysis for all field trial samples. - Continue development of MicroSWIFT/SPRAY (MSS) for improved hazard prediction in urban environments. - Continue enhancements to source term estimation and source characterization algorithms. - Complete development of a secondary evaporation model. Begin integration of secondary evaporation model with MSS. - Continue researching new methods for the development of next generation dispersion models such as hybrid Large Eddy Simulation/Gaussian approaches. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred to another funding line.			
Title: 10) Data Analysis ***Description:*** 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. ***FY 2019 Plans:*** - Continue to develop, revise and integrate CB-1. - Continue to host and maintain online accessibility of CB-1 to the Chemical Biological Defense Program (CBDP) community, as well as enhance online capabilities based on user feedback. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. Program is transferring to CB2 Decision Analysis and Management in FY20.	-	2.364	-
Title: 11) Data Analysis ***Description:*** Develop CBRN data sharing capabilities and simulation tools. Develop chapters of the Chemical and Biological Agent Effects Manual Number 1 (CB-1), an authoritative source capturing analytical methods for evaluating the effects of CB agents on equipment, personnel, and operations. These chapters are developed by a mix of contractors and labs, employing experts in each subject area.	3.334	-	-
Title: 12) Decision Analysis and Management	-	-	17.436

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: 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. ***FY 2020 Plans:*** Hazard Prediction: - Continue development of coupled indoor and outdoor dispersion models for enhanced hazard prediction in urban environments. - Conduct field trial to collect validation data for coupled indoor and outdoor dispersion models. - Continue development of enhancements to human response models for CBRN agent and toxic industrial chemical exposures. - Continue development of MicroSWIFT/SPRAY (MSS) for improved hazard prediction in urban environments. - Complete integration of secondary evaporation model with MSS. - Complete development of a new software architecture for HPAC to meet Common CBRN Model Interface requirements. - Continue development of next generation littoral waterborne modeling system. Analytic Applications Platform: - Develop and implement data standards for the transmission and storage of information sources relevant to the earlier warning of chemical and biological threat agents. - Continue Air Force, Navy, Army, and Marine Corps service specific human performance studies. - Continue efforts to determine the effects of chemical warfare agents (CWAs) on individual tasks. - Complete direct subsurface direct transport measurement studies and continue modeling contact transfer exposures. - Continue to develop, revise and integrate 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. This program subsumes CB2 Hazard Prediction, Operational Effects and Planning, Data Analysis in FY20.			
Title: 13) Threat Agent Sciences	7.158	4.425	13.461
Description: 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.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY20 funding increased due to emerging needs of CBDP. The increased funds will support Biological First Look, Agent Employment Assessment, and Technical Surprise, to include Horizon Scanning and Technical Advancement Impact studies, and Emerging Biology. ***FY 2019 Plans:*** - Continue developing advanced methods for threat agent characterization. - Continue providing data on fate, persistence, and response of priority agents in various environments. - Continue developing methods to understand agent fate on surfaces. - Continue defining particle properties and agent-substrate interaction to predict agent behavior and aerosolization to inform hazard assessment. - Continue studies to provide data to inform operational risk and exposure guidelines, response, detection, and protection; and define goals for the development of decontamination procedures and medical countermeasures. - Continue assessing the impact of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, decontamination, and disinfection). ***FY 2020 Plans:*** - Continue developing advanced methods for threat agent characterization. - Continue developing methods to understand agent fate on operational surfaces. - 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. - Continue assessing the impact of environmental factors on threat agent activity (persistence, transport, degradation, resuspension, and decontamination). Continue identifying and assessing technological advancements that will impact the chemical and biological threat space. - Initiate a framework to quickly analyze emerging biological threats. - Initiate a horizon scanning capability to provide situational awareness in assessing technological convergence that can affect the chemical and biological threat space. - Initiate the assessment of synthetic biological tools and other biotechnology developments that can enhance or alter the threat space. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to accelerated development effort.			
Title: 14) Operational Effects and Planning	8.200	5.675	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: 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. ***FY 2019 Plans:*** - Continue Air Force and Navy service specific human performance studies. Plan and initiate Army and Marine Corps specific operational performance studies. - Continue to enhance CBRN operational risk assessment tools for the Navy. - Continue studies to determine the toxicity levels of Toxic Industrial Chemicals (TICs). - Conduct direct subsurface transport measurement studies and continue modeling contact transfer exposures. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. Program is transferring to CB2 Decision Analysis and Management in FY20.			
Title: 15) Threat Surveillance ***Description:*** 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. ***FY 2019 Plans:*** - Expand the number of pathogens, hosts and vectors incorporated into a robust prediction and forecasting capability. - Develop tactical decision aids on mobile applications to identify risks and provide mitigation strategies for chemical and biological threats. Identify new data streams, such as physiological markers, which can be leveraged to support early warning and forecasting. - Develop a global area of concern forecasting risk map capability. Conduct studies to determine the validity of using wearable biomonitoring data as indicative and predictive of health status in controlled environments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. This program subsumes TM2 Biosurveillance in FY19. Program is transferring to CB2 Warning and Reporting in FY20.	-	10.503	-
Accomplishments/Planned Programs Subtotals	74.565	67.994	77.803

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** CB2 / *CHEMICAL BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CB3: *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	16.878	21.698	16.798	-	16.798	22.039	22.538	22.833	21.682	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
NT2: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	-	51.625	53.720	52.902	-	52.902	50.111	52.385	52.377	52.368	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project NT2 provides early applied research to enhance and develop defensive capabilities against Non-Traditional Agents (NTAs). This project focuses on expanding scientific knowledge required to develop defensive capabilities and to demonstrate fast and agile scientific responses to enhance or develop capabilities that address emerging threats.

Efforts 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Expeditionary Collective Protection	-	0.359	0.790
Description: Develop new technologies for soldiers to determine the remaining chemical vapor service life of their chemical warfare agent (CWA) filters. ***FY 2019 Plans:*** - Assess baseline novel filtration materials against NTAs and other emerging threats under laboratory conditions. - Continue to analyze and characterize the performance of Residual Life Indicator (RLI) satellite filter cartridges against NTAs and other emerging threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to collect data to establish correlation or filter bed performance and pre-filter system against NTAs and other emerging threats. ***FY 2020 Plans:*** - 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. - Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to fact of life change in the program/project.			
Title: 2) Material Contamination Mitigation ***Description:*** Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort. ***FY 2019 Plans:*** - Continue integrating the full range of NTAs and other emerging threats into the material contamination mitigation portfolio. - Continue responsive coatings efforts to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals. - Continue effort to examine how decontamination technologies perform on field assets that include battlefield grime when contaminated with impure weapons-grade representative NTAs. - Continue efforts to develop/enhance NTA mapping (disclosure/assurance) technologies, including generating electronic records of contamination locations. ***FY 2020 Plans:*** - Continue integrating the full range of NTAs and other emerging threats into the material contamination mitigation portfolio. - Continue coatings efforts to enhance NTA decontaminability as part of the systems approach to achieving efficacy goals. . - Continue effort to examine how decontamination technologies perform on field assets that include battlefield grime when contaminated with impure weapons-grade representative NTAs. - Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.609	0.605	0.792

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to fact of life change in the program/project.			
Title: 3) Personnel Contamination Mitigation	1.493	0.359	0.444
Description: 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. ***FY 2019 Plans:*** - Continue efforts to develop an alternative to Reactive Skin Decontamination Lotion (RSDL), including efficacy data against representative NTAs in close coordination with concurrent medical testing required to achieve FDA approval. - 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. ***FY 2020 Plans:*** - Assess decontamination effectiveness of different methods of applying decontamination to hair and skin to discern the most efficient way of decontaminating personnel against NTAs and advanced threats. - Continue personnel decontamination efforts discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 4) Respiratory and Ocular Protection	0.733	1.250	0.791
Description: 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. ***FY 2019 Plans:*** - 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. ***FY 2020 Plans:*** - Continue discovery, development and testing of materials capable of sorption and reaction of NTAs for next generation filter materials.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to explore technologies for oxygen storage and CO2 removal including materials and components of this and integrate into Full-Spectrum Respiratory Protection Systems (FSRPS) a component of Tactical All Hazard Ensemble for advanced and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.			
Title: 5) Chemical Therapeutics - Medical ***Description:*** 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. ***FY 2019 Plans:*** - Continue pursuit of analogs of therapeutic compounds to treat NTA exposures. - Continue to test compounds using high-throughput, in vitro screens. - Continue to evaluate licensed FDA therapeutics against selected, priority NTAs. - Continue to evaluate compounds at the ADMET CoE to identify leads. Deliver information on the evaluation of FDA licensed/ approved products for therapeutic applications for countering the deleterious effects of an NTA exposure to the advanced developer. - Continue animal studies to support regulatory submission of candidate therapeutics for treatment of the toxic effects of selected, priority NTAs. ***FY 2020 Plans:*** - 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. - Continue animal studies to support regulatory submission of candidate therapeutics for treatment of the toxic effects of selected, priority NTAs. - Continue drug formulation efforts for MCMs with a longer shelf-life and with feasibility of an auto-injector containing material and chemical composition. - Initiate efforts in neuroprotective therapeutics to increase the quality of life after chemical agent exposure. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	19.372	19.272	20.700

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Minor change due to routine program adjustments.			
Title: 6) Modeling & Simulation	1.524	1.707	1.714
Description: Provide modeling of NTA materials for hazard prediction. Develop NTA source term algorithms for predicting chemical hazards from intentionally functioning weapons, counter-proliferation scenarios (bomb on target), and missile intercept. Investigate NTA agent fate for secondary effects, environmental/atmospheric chemistry, atmospheric and waterborne transport and dispersion, human effects, model Validation and Verification (V&V), scaled testing, casualty estimation, and supporting data management. ***FY 2019 Plans:*** - Complete development of agent fate modeling for NTAs. - Initiate expansion of System for Hazard Assessment of Released Chemicals (SHARC) to model biological agent. ***FY 2020 Plans:*** - Continue development of methodologies to model NTAs with limited source data. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 7) Percutaneous Protection	-	1.600	1.195
Description: Study and assessment of percutaneous protective technologies to include membrane and composite material ("novel materials"/"multifunctional materials"). ***FY 2019 Plans:*** - Continue development of novel materials and ensembles that provide protection against NTAs and emerging threats. - Initiate additional NTA and other emerging threats tests. ***FY 2020 Plans:*** - Continue investigation and scaling of membrane materials for protection against NTAs and emerging threats. - Continue investigation of new/novel sorptive materials for percutaneous protection. - Continue development of deliverables including lessons learned and seam sealing against NTAs and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to fact of life change in the program/project.			
Title: 8) Threat Agent Sciences	19.053	19.851	20.076

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: 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 and development of Concept of Operations (CONOPs) and Tactics, Techniques and Procedures (TTP); it also provides the basis for countermeasure development and assessment. ***FY 2019 Plans:*** - 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. - Continue to build linkages between emerging threat characterization and advanced development capability assessments to better define current capability gaps for emerging threats. - Continue evaluating synthesis pathways, physicochemical properties and environmental fate properties for priority threats. - Continue assessing the impact of environmental factors and substrate properties on threat agent activity (e.g. persistence, transport, degradation, resuspension). - Continue preparing laboratory and operationally-relevant toxicity estimates for next priority NTAs. - Continue to refine and deliver human toxicity estimates for next priority NTAs. - Continue development of medium- to high-throughput laboratory approaches to predict acute systemic toxicity. Expand computational and in vitro research efforts concerning ADMET, physical and chemical characterization and behavior. ***FY 2020 Plans:*** - 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. - Continue to build linkages between emerging threat characterization and advanced development capability assessments to better define current capability gaps for emerging threats. - Continue evaluating synthesis pathways, physicochemical properties and environmental fate properties for priority threats. - Continue assessing the impact of environmental factors and substrate properties on threat agent activity (e.g. persistence, transport, degradation, resuspension). - Continue preparing laboratory and operationally-relevant toxicity estimates for next priority NTAs. - Continue to refine and deliver human toxicity estimates for next priority NTAs. - Continue development of medium- to high-throughput laboratory approaches to predict acute toxicity.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to expand and refine computational and in vitro research efforts, physical and chemical characterization and behavior to support toxicity evaluation and prediction. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 9) Chemical Pretreatments and Prophylactics - Medical ***Description:*** 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. 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. ***FY 2019 Plans:*** - Continue efforts to develop catalytic enzymes for use against selected, priority NTAs. - Continue to explore alternative technologies for prophylaxis to address capability gaps such as immunogenicity, circulatory stability, dosing, shelf-life, and delivery. - Complete evaluation of Food and Drug Administration (FDA) licensed MCMs for potential pretreatment/prophylaxis against NTAs and emerging chemical threats. - Continue research projects at the ADMET CoE to improve MCM understanding and facilitate development. - Continue new approaches to identify pretreatment and prophylaxis against multiple classes of NTAs. ***FY 2020 Plans:*** - Continue efforts to develop catalytic enzymes for use against selected, priority NTAs. - Continue expanded pre-clinical studies of lead catalytic scavengers to support future investigative new drug (IND) filing. - Continue evaluation of FDA-licensed MCMs for potential pretreatment/prophylaxis against NTAs and emerging chemical threats. - Continue new approaches to identify pretreatment and prophylaxis against multiple classes of NTAs and emerging chemical threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	7.841	8.717	6.400
Accomplishments/Planned Programs Subtotals	51.625	53.720	52.902

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	Project (Number/Name) NT2 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (APPLIED RESEARCH)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• NT3: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	20.781	22.749	24.180	-	24.180	30.295	31.085	31.076	31.071	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 2	R-1 Program Element (Number/Name) PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	Project (Number/Name) TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TM2: *TECHBASE MED DEFENSE (APPLIED RESEARCH)*	-	73.276	70.960	71.882	-	71.882	76.953	78.329	75.839	75.928	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.

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)	FY 2018	FY 2019	FY 2020
Title: 1) Biosurveillance	3.804	-	-
Description: Biosurveillance/Disease Surveillance: Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems. Leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools. The CBDP partners with civil agencies and Department of Defense (DoD) agencies to provide near real-time information and provide situational awareness, yielding analytical and predictive capabilities for DoD decision makers including CCDRs. This program is transferring in FY19 to CB2 (Chemical Biological Defense) Threat Surveillance.			
Title: 2) Chemical Diagnostics	3.198	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Focuses on developing state-of-the-art laboratory/fieldable methods that detect exposure to CWA/NTA in clinical samples. Identifies biomolecular targets that can be leveraged as analytical methodologies, as well as, laboratory and animal studies characterizing time-course and longevity of a particular analyte/biomarker. This effort is transferring in FY19 to TM2 (Techbase Med Defense) Medical Diagnostics.			
Title: 3) Diagnostic Assays ***Description:*** Development and verification of rapid, sensitive, and specific tests for the identification of Biological Warfare Agents (BWA) and their expressed pathogens and toxins in clinical specimens from Warfighters for the diagnosis of exposure/infection. Discovery of host biomarkers generated in response to exposure to biological threat agents, whether known or emerging. This effort is transferring in FY19 to TM2 (Techbase Med Defense) Medical Diagnostics.	3.266	-	-
Title: 4) Next Generation Diagnostics ***Description:*** Diagnostic device development to include systems able to harness next generation technologies to revolutionize clinical diagnostics in care facilities and in hospital laboratories. This investment will incorporate capabilities such as next generation sequencing and advanced biomolecular methods to harness both host and pathogen biomarkers in a threat agnostic approach that will serve all echelons of military medical care. This effort is transferring in FY19 to TM2 (Techbase Med Defense) Medical Diagnostics.	1.394	-	-
Title: 5) Medical Diagnostics ***Description:*** 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. ***FY 2019 Plans:*** - Continue the development of a diagnostic platform to diagnose chemical exposure at the point-of-care. - 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. - Continue assay development for extremely difficult to detect/diagnose intracellular pathogens of severe acute systemic febrile illnesses.	-	13.150	11.945

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Initiate efforts to exploit gene-editing systems for development of robust diagnostic platforms with reduced cold-chain needs. ***FY 2020 Plans:*** - Complete assay development for extremely difficult to detect/diagnose intracellular pathogens of severe acute systemic febrile illnesses. - Continue the development of a diagnostic platform to diagnose chemical exposure at the point-of-care. - 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. - Continue efforts to exploit gene-editing systems for development of robust diagnostic platforms with reduced cold-chain needs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. This program subsumes TM2 (Techbase Med Defense) Chemical Diagnostics, TM2 (Techbase Med Defense) Diagnostic Assays, and TM2 (Techbase Med Defense) Next Generation Diagnostics in FY19. FY20 funding decrease due to POM reduction.			
Title: 6) Viral/Bacterial/Toxins Vaccines ***Description:*** 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. ***FY 2019 Plans:*** - Continue selection of T and B cell antigens for Q Fever vaccine candidates. - Continue analysis of candidate Q fever vaccines. Continue down-selection of subunit tularemia vaccine candidates in animal models. Continue development of animal models for medical countermeasure development against aerosolized biological toxins including marine toxins. - Continue nonclinical efficacy and clinical safety development of candidate vaccines against Marburgvirus. Evaluate potential for boosting of recombinant vesicular stomatitis virus (rVSV)- based ebolavirus vaccine. - Continue detailed immune correlate studies of filovirus vaccines for animal rule licensure including antibody response maturation and passive transfer studies. - Continue improvements to delivery mechanism, immunogenicity, efficacy and manufacturing of VEEV DNA vaccine and the trivalent WEVEE vaccine including animal modeling. - Initiate development of multiplexed VEEV infection biomarker assay. - Continue to assess MCM capabilities and strategies to defend against emerging and genetically engineered bioweapon (BW) threat agents. ***FY 2020 Plans:***	16.918	18.663	17.486

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Evaluate Q fever vaccines based on selected T and B cell antigens. - Continue development of well-defined animal models for medical countermeasure development against aerosolized biological toxins including marine toxins. - Continue development of nanoparticle and other subunit tularemia vaccines. - Continue development of Burkholderia and Yersinia vaccines. - Continue nonclinical efficacy, safety and manufacturing development of candidate vesicular stomatitis virus (VSV) and DNA vaccines against Marburg virus. - Continue improvements to delivery mechanism, immunogenicity, efficacy and manufacturing of VEEV DNA vaccine. - Continue qualification/validation of well-defined animal models for alphaviruses. - Continue development of multiplexed VEEV infection biomarker assay and qualification/validation of VEEV immune assays for clinical and pivotal animal studies. - Continue to assess MCM capabilities and strategies to defend against emerging and genetically engineered biological warfare (BW) threat agents ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 7) Vaccine Platforms and Research Tools	8.145	9.087	7.108
Description: 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. ***FY 2019 Plans:*** - Continue evaluation of multivalent hybrid vaccines: structural analysis and performance in the biomimetic Modular Immune In-vitro Construct (MIMIC) system. - Maintain capability and continue assessment of Burkholderia and Q fever vaccine candidates in the MIMIC system. - Continue MIMIC development for use in evaluation of pulmonary responses to biodefense vaccines. - Complete evaluation of production and scale-up of trivalent inactivated alphavirus vaccines and use of these vaccines to generate new WEVEE monoclonal antibodies (mAbs). Analyze mAbs for neutralizing activity and map epitopes of strongly neutralizing mAbs. - Sustain the Human Specimen Archive at USAMRIID.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue in vivo down selection of next generation Toll Like Receptor agonist adjuvants for use in Q fever and other biodefense vaccines. ***FY 2020 Plans:*** - Continue nonclinical evaluation of hybrid arenavirus and filovirus antigen vaccines in animal models. - Continue evaluation of Burkholderia, Q Fever and filovirus vaccines in the biomimetic Modular Immune In-vitro Construct (MIMIC) system. - Continue development of inactivated alphavirus vaccine. - Qualify/validate MIMIC for use in evaluation of pulmonary responses to biodefense vaccines Sustain the Human Specimen Archive at USAMRIID. - Continue evaluation of next generation adjuvants for use in biodefense vaccines. - Continue evaluation of the combined Zaire/Sudan vaccine platform for filovirus. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 8) Viral Therapeutics ***Description:*** Identify, optimize and evaluate lead candidate therapeutics for efficacy against viral pathogens. ***FY 2019 Plans:*** - Continue screening, evaluation and development of novel small molecule inhibitors and monoclonal antibodies effective against filo- and alpha-virus infections in vitro and in vivo. - Continue development of small molecule ribonucleoside viral replication inhibitors directed against alphaviruses. Develop alphavirus animal models for evaluation of therapeutic countermeasures for use with Animal Rule Guidance by the FDA. - Continue optimization of broad-spectrum inhibitors of filovirus infection that antagonize NPC1-GP interactions. - Continue studies to enhance anti-viral therapies against Ebola (Zaire) and Marburg Viruses. - Continue funding small molecule/repurposing efforts. - Begin feasibility studies on reducing neuro-inflammation by repurposing existing therapeutics. ***FY 2020 Plans:*** - Continue screening, evaluation and development of novel small molecule inhibitors and monoclonal antibodies effective against filo- and alpha-virus infections in vitro and in vivo. - Continue the development of small molecule ribonucleoside viral replication inhibitors directed against alphaviruses. - 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. - Continue optimization of broad-spectrum inhibitors of filovirus infection that antagonize NPC1-GP interactions.	11.382	7.910	7.895

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue studies to enhance anti-viral therapies against Ebola (Zaire, Sudan, Bundibugyo), and Marburg Viruses. - Continue funding small molecule/repurposing efforts. - 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. - Continue discovery and early development of novel monoclonal antibodies from survivors to alphavirus and arenavirus infections. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 9) Bacterial Therapeutics ***Description:*** Identify, optimize and evaluate lead therapeutic candidates effective against designated bacterial threat agents. ***FY 2019 Plans:*** - 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. - 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. - Complete evaluation of reformulation and/or targeted delivery approaches to enhance efficacy of poorly performing or failed drug candidates. ***FY 2020 Plans:*** - 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. - Initiate evaluation of the potential of antibody and derivatives to treat intracellular bacterial infection. - 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. FY20 funding increase due to multiple ongoing projects in discovery and new awards (begin ramping up in FY19).	14.122	10.933	16.379
Title: 10) Toxin Therapeutics ***Description:*** Identify, optimize and evaluate therapeutic candidates that are effective against biological toxin agents. ***FY 2019 Plans:***	0.958	0.156	0.319

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Develop single domain monoclonal antibody in small animal studies. ***FY 2020 Plans:*** - Continue development of a scMAb (single chain monoclonal antibody) which is capable of entering the neuromuscular junction in an attempt to abrogate BoNT intoxication. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 11) Chemical Therapeutics ***Description:*** 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. ***FY 2019 Plans:*** - Continue supporting validation and characterization of therapeutics for: 1) an improved broad spectrum oxime; 2) compounds effective in the brain for enhanced neuroprotection and 3) compounds effective in the brain for enhanced survival. - Continue exploring technologies for delivery of therapeutics to the brain crossing the Blood Brain Barrier (BBB). - Continue supporting development and screening for broad spectrum cholinesterase reactivators that work in the brain. - Continue development of animal models for operationally relevant threat agent exposure and medical countermeasure efficacy. ***FY 2020 Plans:*** - Continue validation and characterization of therapeutics for: 1) an improved broad spectrum oxime-based reactivator and 2) compounds effective in the brain for enhanced neuroprotection and/or increased survival. - Continue exploring technologies for delivery of therapeutics to the brain (crossing the BBB). - Continue development of current and screening for novel broad spectrum cholinesterase reactivators that are effective in the brain. - Continue development of animal models for operationally relevant threat agent exposure and medical countermeasure efficacy. - Continue efforts to explore safety and efficacy of down-selected therapeutic decontaminants. - Continue efforts to develop therapeutic medical countermeasures to treat mustard agent pulmonary injury. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	9.553	10.512	10.213

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to fact of life change in the program/project.			
Title: 12) Pretreatments and Prophylactics, Nerve Agents	0.536	0.549	0.537
Description: 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. ***FY 2019 Plans:*** - Continue efforts developing prophylactic and pretreatment medical countermeasures. - Continue development of animal models for operationally relevant exposures to better support development of pretreatment and prophylactic MCMs and MCM concepts of use including post-exposure pre-symptomatic applications. ***FY 2020 Plans:*** - Continue efforts to develop capability for rapid development of medical countermeasures. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	73.276	70.960	71.882

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• TM3: *TECHBASE MED DEFENSE (ATD)*	92.231	88.188	120.526	-	120.526	128.035	127.992	122.006	122.553	Continuing	Continuing
• MB4: *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*	71.070	65.209	48.166	-	48.166	75.343	70.991	78.526	73.550	Continuing	Continuing
• MC4: *MEDICAL CHEMICAL DEFENSE (ACD&P)*	4.666	2.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.054
• MB5: *MEDICAL BIOLOGICAL DEFENSE (EMD)*	130.240	117.331	119.227	-	119.227	97.501	71.221	78.435	82.815	Continuing	Continuing
• MC5: *MEDICAL CHEMICAL DEFENSE (EMD)*	58.419	57.545	62.051	-	62.051	64.331	56.641	28.559	26.976	Continuing	Continuing
• MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 2	**R-1 Program Element (Number/Name)** PE 0602384BP / *CHEMICAL/BIOLOGICAL DEFENSE (APPLIED RESEARCH)*	**Project (Number/Name)** TM2 / *TECHBASE MED DEFENSE (APPLIED RESEARCH)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	141.242	142.826	172.486	-	172.486	191.380	192.619	186.918	186.307	Continuing	Continuing
CB3: *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	-	16.878	21.698	16.798	-	16.798	22.039	22.538	22.833	21.682	Continuing	Continuing
NT3: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	-	20.781	22.749	24.180	-	24.180	30.295	31.085	31.076	31.071	Continuing	Continuing
TM3: *TECHBASE MED DEFENSE (ATD)*	-	92.231	88.188	120.526	-	120.526	128.035	127.992	122.006	122.553	Continuing	Continuing
TT3: *TECHBASE TECHNOLOGY TRANSITION*	-	11.352	10.191	10.982	-	10.982	11.011	11.004	11.003	11.001	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. The Project continues to pursue solutions against traditional agents.

- NTA Defense (NT3): dedicated research (both medical and non-medical) is consolidated in NT3. This effort includes NTA chemical diagnostics, medical pretreatments, therapeutics, detection, and protection and hazard mitigation.

- 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*

The CBDP S&T Advanced Technology Development stakeholders: United States Army Edgewood Chemical Biological Center (ECBC), United States Army Medical Research Institute of Infectious Diseases (USAMRIID), United States Army Medical Research Institute of Chemical Defense (USAMRICD), United States Army Natick Soldier Systems Center, Naval Research Lab (NRL), Air Force Research Lab (AFRL), among others. The intent is to maintain strategic partnerships with the DoD Service communities for mission success across the enterprise through collaborative planning and programming maintaining budget assurance.

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

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	145.359	142.826	150.168	-	150.168
Current President's Budget	141.242	142.826	172.486	-	172.486
Total Adjustments	-4.117	0.000	22.318	-	22.318
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.974	-			
• SBIR/STTR Transfer	-3.143	-			
• Other Adjustments	0.000	-	22.318	-	22.318

Change Summary Explanation

Funding: FY18 (-$0.974M): Reprogramming adjustments to balance overall portfolio efforts.
FY18 (-$3.143M): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+$31.400M): Increase for Medical Countermeausures Initiative and CBDP Support to Bio-Incident Response.
FY20 (-$9.082M): Funds transfered to BA2 - Threat Agent Science portfolio to expand threat characterization and assessments to minimize surprise from emerging and advanced CBRN threats

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	Project (Number/Name) CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CB3: *CHEMICAL BIOLOGICAL DEFENSE (ATD)*	-	16.878	21.698	16.798	-	16.798	22.039	22.538	22.833	21.682	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. 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Expeditionary Collective Protection	0.723	0.106	0.639
Description: Develop new technologies for soldiers to determine the remaining chemical vapor service life of their chemical warfare agent (CWA) filters. ***FY 2019 Plans:*** - Continue from FY18 CB3 (Chemical Biological Defense)/Expeditionary Collective Protection integration and surveillance of Guard Bed filters and residual life indicator (RLI). - Continue to pull satellite cartridges and the primary ColPro filter (M98) filters for surveillance testing and assessment. This effort is ongoing to FY21. ***FY 2020 Plans:*** - Continue testing of RLI and Guard Bed 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 2) Material Contamination Mitigation	1.626	1.912	1.952
Description: Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort. ***FY 2019 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Transition sorbent 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 TRL6. - Continue coatings optimization utilizing new chemical agent resistance method to reduce chemical absorption. - Continue Wide Area Decontamination of Bacillus anthracis projects, focusing on varied subscale testing environments. - Continue to optimize the decontamination parameters for the hot air biological decontamination effort, including the introduction of germinates to address sensitive equipment, platform interior, and aircraft decontamination needs and reduce the time and logistical burden associated with the process. - Continue chemical hot air decontamination effort including the insertion of aerosolized decontaminants to reduce the time and logistical requirements associated with addressing sensitive equipment, platform interior, and aircraft chemical warfare agent decontaminant needs in a relevant environment. ***FY 2020 Plans:*** - Complete development of Wide Area Decontamination of Anthrax agricultural spray technology focusing on testing in outdoor environments and related data analysis from demonstrations. - Continue evaluation of disclosure spray in low light and other relevant environments. - Continue evaluation and testing of hot air decontamination of equipment and personal effects. - Complete optimization of chemical hot air decontamination process and transition to advance development. - Continue scale up materials successfully tested and integrate into filters for testing against threat agents of interest. - Initiate demonstration of temporary coatings to improve vehicle decontaminability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) Percutaneous Protection ***Description:*** 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. ***FY 2020 Plans:*** - Continue investigation of materials and integration of successfully tested materials into fibers, fabrics, yarns and elastomeric materials. - 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. - Complete development of Level A/B All Hazards ensembles and transition to advance development.	0.690	-	0.285

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue scale up materials successfully tested and integrate into filters for testing against threat agents of interest. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 4) Respiratory and Ocular Protection ***Description:*** 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). ***FY 2019 Plans:*** - Continue to acquire and assemble Closed Circuit Self Contained Breathing Apparatus (CC-SCBA) subsystems into a hybrid technology prototype system. Build and test Full-Spectrum Respiratory Protection System (FSRPS) prototypes that include all sensors and control technology solutions. - 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. ***FY 2020 Plans:*** - Continue scale up materials successfully tested and integrate into filters for testing against threat agents of interest. - Complete development and transition of FSRPS that provide CB respiratory protection technologies in support of tactical all hazard program of record. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.	1.136	1.975	0.962
Title: 5) Biosurveillance (BSV) ***Description:*** Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools. This program is transferring to CB3 M&S (Chemical Biological Defense) Threat Surveillance in FY19.	2.325	-	-
Title: 6) Detection	2.693	6.122	6.156

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: 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 can include 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. ***FY 2019 Plans:*** - Complete the development of sample preparation techniques to enhance environmental detection platforms. - Continue the development of proteomic detection capabilities, to include expansion into the methodologies to detect novel threats. ***FY 2020 Plans:*** - Continue the development of proteomic detection capabilities, to include expansion into the methodologies to detect novel threats. - Continue development of CB sensors for mobile applications to enhance early warning and situational awareness of CB threats. - Initiate development of CB sensors for distributed reconnaissance purposes. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 7) Hazard Prediction ***Description:*** 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. ***FY 2019 Plans:*** - Continue performance optimization and high fidelity enhancements for transport and dispersion models, particularly for urban environments. - Continue configuration management of science and technology prototype for transition of upgraded capabilities to Joint Effects Model (JEM). - Continue upgrading science and technology prototype to Common CBRN Modeling Interface (CCMI) architecture. - Complete validation and verification (V&V) studies for high fidelity source term algorithms. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	5.782	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to change in program/project technical parameters. Program will transfer to CB3 Decision Analysis and Management in FY20.			
Title: 8) Hazard Prediction ***Description:*** 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. CB3 M&S DST transferred to CB3 M&S in FY19.	3.404	-	-
Title: 9) Data Analysis ***Description:*** 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.	0.029	-	-
Title: 10) Data Analysis ***Description:*** 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. Program will transfer to CB3 Decision Analysis and Management in FY20. ***FY 2019 Plans:*** - Complete the digitization effort at the United Stated Army Heritage and Education Center and make the digitized documents accessible through CB-1s online portal. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	-	0.103	-
Title: 11) Operational Effects ***Description:*** 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	-	2.027	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
(CBRN) incidents on decision-making. Focus areas include consequence management, population modeling, and knowledge management. Program will transfer to CB3 Decision Analysis and Management in FY20. ***FY 2019 Plans:*** - Continue Decontamination and Individual Protection SPM integration and advanced development. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 12) Operational Effects ***Description:*** 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.	4.252	-	-
Title: 13) Decision Analysis and Management ***Description:*** 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. ***FY 2020 Plans:*** - Mature comprehensive infectious disease epidemiological modeling applications for disease prediction, forecasting, and burden estimates from contagious infectious disease outbreaks. Incorporate uncertainty estimates into disease forecasting and prediction models. - Mature data visualization displays of disease model outputs. Incorporate newly characterized threat agent properties into hazard prediction models. - Continue performance optimization and high fidelity enhancements for transport and dispersion models, particularly for urban environments. - 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. - Continue configuration management of science and technology prototype for transition of upgraded capabilities to Joint Effects Model (JEM).	-	-	5.783

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Complete upgrades to science and technology prototype modules to meet Common CBRN Modeling Interface (CCMI) architecture requirements. - Develop algorithms to leverage non-invasive host based devices to provide earlier warning of chemical and biological threats and/or exposure. - Develop automated decision aids and reference guides to assist tactical users in properly responding to chemical and biological threats. 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. This program will subsume CB3 Hazard Prediction, Operational Effects and Planning, Data Analysis in FY20.			
Title: 14) Threat Surveillance ***Description:*** 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. ***FY 2019 Plans:*** - Identify sources for pathogen data and develop tools to mine data sources (PubMed, Google Books, online journals) to create a comprehensive human, animal, and plant pathogen database. Link pathogen database to disease ontologies and develop the capability for automatic pathogen updates from newly published data. - Enhance the Biosurveillance Ecosystem (BSVE) framework to support the rapid integration of multiple data sources, tools, algorithms, and services that support chemical and biological defense. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. This program subsumes CB3 Biosurveillance and TM3 Biosurveillance efforts in FY19. In FY20, this program will transfer to CB3 Warning and Reporting.	-	3.671	-
Title: 15) Warning and Reporting ***Description:*** 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. ***FY 2020 Plans:***	-	-	1.021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** CB3 / *CHEMICAL BIOLOGICAL DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- 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. - Continue research and analysis efforts to provide objective, quantitative analysis in support of science and technology initiatives, material developments, operational guidance, and requirements settings. - Initiate transition of the Individual Protection System Performance Model to Service users. - Continue the advanced development of the Decontamination System Performance Model. - Continue to host CB-1 and start review of user feedback for periodic updates to CB-1 material. - Initiate digitization of historic data and information pertaining to Chemical and Biological warfare at other sites with relevant archival holdings. - Initiate integration of Graphics Processing Units methodologies into hazard prediction software and initiate user testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. CB3 Threat Surveillance will transfer to this program in FY20.			
Accomplishments/Planned Programs Subtotals	16.878	21.698	16.798

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CA4: *CONTAMINATION AVOIDANCE (ACD&P)*	30.844	31.527	19.074	-	19.074	8.864	8.215	15.106	13.706	Continuing	Continuing
• DE4: *DECONTAMINATION SYSTEMS (ACD&P)*	9.888	6.117	8.735	-	8.735	10.258	9.511	6.044	5.905	Continuing	Continuing
• IS4: *INFORMATION SYSTEMS (ACD&P)*	5.336	0.854	0.528	-	0.528	0.174	0.070	0.067	0.067	Continuing	Continuing
• TE4: *TEST & EVALUATION (ACD&P)*	9.097	6.563	5.162	-	5.162	5.156	3.541	3.541	3.541	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	Project (Number/Name) NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
NT3: *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*	-	20.781	22.749	24.180	-	24.180	30.295	31.085	31.076	31.071	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.

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.

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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Material Contamination Mitigation	1.015	0.128	0.520
Description: Develop highly effective non-traditional or novel decontamination technologies that integrate with current procedures and support non-material improvements of the overall decontamination effort. ***FY 2019 Plans:*** - 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 hot air decontamination effort to address sensitive equipment, platform interior, and aircraft NTA decontaminant needs in a relevant environment and identifying potential battlefield interferants.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue optimization efforts to develop/enhance NTA mapping (disclosure/assurance) technologies in simulated relevant environments. ***FY 2020 Plans:*** - Complete optimization of chemical hot air decontamination process and transition to advance development. Perform field trials under relevant conditions e.g. complex surfaces, and dirty/fouled surfaces against advanced threats. - Continue integration of successfully tested materials capable of sorption and reaction of NTAs for next generation filter applications. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to fact of life change in the program/project.			
Title: 2) Personnel Contamination Mitigation ***Description:*** 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. ***FY 2019 Plans:*** - Continue personnel decontamination efforts to enhance current processes including efficacy data against representative NTAs and emerging threats in relevant environments and identifying battlefield interferants. ***FY 2020 Plans:*** - Assess decontamination effectiveness of different methods of applying decontamination to hair and skin to discern the most efficient way of decontaminating personnel against NTAs and advanced threats. - Continue integration of successfully tested materials capable of sorption and reaction of NTAs for next generation filter applications. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	0.757	0.354	0.408
Title: 3) Respiratory and Ocular Protection ***Description:*** 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. ***FY 2019 Plans:*** - Continue to acquire and assemble closed circuit self-contained breathing apparatus (CC-SCBA) subsystems into a hybrid technology prototype system. Build and test FSRPS prototypes that include all sensors and control technology solutions.	0.307	1.811	0.688

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue to scale up nano-structured porous materials for air purification. - Continue to conduct performance evaluation and demonstration of full spectrum respiratory protection system (FSRPS) prototypes. - Continue to assess novel filtration materials against new emerging threats. ***FY 2020 Plans:*** - Continue integration of successfully tested materials capable of sorption and reaction of NTAs for next generation filter applications. - Continue refining technologies that enhance face-piece seals performance, lens fogging resistance, and comfort and demonstrate refined full spectrum respiratory protection system (FSRPS) prototype. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.			
Title: 4) Therapeutics - Medical ***Description:*** 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. Physiological parameters and pathological assessments will be used to establish the general mode and mechanisms of toxicity required for therapeutic development. ***FY 2019 Plans:*** - Continue investigating technologies to deliver therapeutics to the brain. - Continue evaluating novel therapeutics using high-throughput in vitro screens. - Continue optimization on novel therapeutic compounds. - Continue validating animal models for use in NTA exposure studies. ***FY 2020 Plans:*** - Continue investigating technologies for delivering therapeutics to the brain. - Continue optimizing and evaluating novel therapeutic in animal models and initiate preclinical studies in support of investigative new drug (IND) submission. - Initiate drug repurposing effort to identify therapeutics for selected NTAs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	2.768	3.118	4.436
Title: 5) Detection	11.110	11.283	11.434

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Focuses on technologies to provide NTA detection capabilities. ***FY 2019 Plans:*** - Complete prototype of chemical sensors for persistent sensing and chemical reconnaissance applications. - Complete the development of a man worn environmental sensor for detecting exposure to chemical hazards. Transitioning to Wearable Chemical Agent Detector (WCAD). ***FY 2020 Plans:*** - Initiate the development of detection technologies to provide a handheld chemical survey tool to detect and locate deposited liquid and solid threats on surfaces. - Initiate the development of sensor technologies against non-traditional threats of concern. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 6) Modeling & Simulation ***Description:*** 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. ***FY 2019 Plans:*** - Complete system performance model integration and development for program-wide exploitation for decontamination. ***FY 2020 Plans:*** - 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.	0.206	0.236	0.236
Title: 7) Percutaneous Protection ***Description:*** 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. ***FY 2020 Plans:*** - Continue investigation of new/novel sorptive materials for percutaneous protection and integrate into fabrics, yarns, fibers for testing against chemical and biological agents.	0.157	-	0.588

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue final technical and user assessments against nontraditional agents (NTAs) and emerging threats on the tactical all hazards suits. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 8) Test & Evaluation ***Description:*** Develop test and evaluation technologies and processes in support of NTA activities. ***FY 2019 Plans:*** - Complete the rapid prototyping and evaluation of chemical detection platforms, specifically addressing vapor passive sensing, identification of liquid chemical threats, and the detection of solids. ***FY 2020 Plans:*** - Complete the rapid prototyping and evaluation of chemical detection platforms addressing man-worn vapor detection technologies. - Continue rapid prototyping and evaluation of chemical detection platforms addressing standoff chemical detection capabilities. - Initiate rapid prototyping and evaluation of chemical detection platforms addressing distributed CB reconnaissance capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.841	0.776	0.785
Title: 9) Pretreatments and Prophylactics - Medical ***Description:*** 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). ***FY 2019 Plans:*** - Initiate studies to support clinical development of prophylaxis for selected NTAs if warranted based upon data from FY18 proof-of-concept studies. - Continue efforts to develop two organophosphorus nerve agents (OPNA) scavenger enzymes to meet requirements of a prophylactic medical countermeasure. ***FY 2020 Plans:*** - Continue efforts to develop OPNA catalytic scavenger enzymes in support of investigational new drug (IND) submission to the FDA.	3.620	5.043	5.085

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** NT3 / *TECHBASE NON-TRADITIONAL AGENTS DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Initiate prophylactic studies of Medical Countermeasures (MCMs) against additional selected NTAs and continue efforts as needed.			
FY 2019 to FY 2020 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	20.781	22.749	24.180

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CA4: *CONTAMINATION AVOIDANCE (ACD&P)*	30.844	31.527	19.074	-	19.074	8.864	8.215	15.106	13.706	Continuing	Continuing
• DE4: *DECONTAMINATION SYSTEMS (ACD&P)*	9.888	6.117	8.735	-	8.735	10.258	9.511	6.044	5.905	Continuing	Continuing
• IP4: *INDIVIDUAL PROTECTION (ACD&P)*	4.421	3.228	1.997	-	1.997	1.997	2.994	0.000	0.000	0.000	14.637
• MC4: *MEDICAL CHEMICAL DEFENSE (ACD&P)*	4.666	2.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.054
• TE4: *TEST & EVALUATION (ACD&P)*	9.097	6.563	5.162	-	5.162	5.156	3.541	3.541	3.541	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	Project (Number/Name) TM3 / *TECHBASE MED DEFENSE (ATD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TM3: *TECHBASE MED DEFENSE (ATD)*	-	92.231	88.188	120.526	-	120.526	128.035	127.992	122.006	122.553	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.

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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Assays and Reagents ***Description:*** Development and verification of rapid, sensitive, and specific tests for the identification of Biological Warfare Agents (BWAs) and their expressed pathogens and toxins in clinical specimens from Warfighters for the diagnosis of exposure/infection. Discovery of host biomarkers generated in response to exposure to biological threat agents. This program is transferring in FY19 to TM3 (Techbase Med Defense) Medical Diagnostics.	27.423	-	-
Title: 2) Bacterial Therapeutics ***Description:*** Identify, optimize and evaluate potential therapeutic compounds effective against bacterial threat agents. ***FY 2019 Plans:*** - Continue multiple efforts to advance candidate therapeutics, with a focus on non-traditional candidates, through preclinical evaluation toward investigative new drug (IND) and phase I clinical studies. Complete optimization of dosing regimen and formulation of a novel orally-delivered therapeutic in models of B. pseudomallei infection. - 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 Good Laboratory Practices Non-Human Primate	15.733	17.580	12.058

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
(GLP NHP) models against aerosolized challenge of Yersinia pestis, Bacillus anthracis, or Francisella tularensis in support of submission of a supplemental New Drug Application (sNDA) under the Animal Rule. ***FY 2020 Plans:*** - 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. - 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. FY20 decrease due to significant investments in pre-clinical development of candidates concluded in FY19, replacements have been selected, awards are pending and subject to availability of funds.			
Title: 3) Bacterial/Toxin Vaccines ***Description:*** Evaluate the best single agent bacterial and toxin vaccines and pretreatments for effectiveness against aerosol challenge in large animal models. ***FY 2019 Plans:*** - Complete validation of T cell and B cell epitopes and antigens for Q Fever vaccine design and testing. - Complete down-selection of live attenuated Tularemia vaccine candidates for advancement into manufacturing and clinical development. - Continue manufacturing development and IND enabling studies of Outer Membrane Vesicle (OMV) and other lead Burkholderia candidates based on results in animal models. - Continue development of human monoclonal antibodies to ricin toxin selected from vaccinated volunteers. - Continue evaluation of efficacy and conjugate production and formulation of capsule conjugate anthrax vaccine in combination with Protective-antigen (PA)-based vaccine. Define correlate of immunity of next generation CPS conjugate anthrax vaccine. - Continue evaluation and manufacturing development of Burkholderia OMV vaccine. - Continue animal-rule efficacy studies of multivalent monoclonal antibody cocktail for protection against A and B serotypes of botulinum neurotoxin in relevant animal models. - Complete botulinum toxin mAb manufacturing and formulation development and release assay qualification and validation including reference standards. - Complete botulinum toxin mAb manufacture and prepare IND.	17.694	17.871	14.518

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Initiate formulation development and efficacy studies of pentavalent mAb product against botulinum intoxication targeting serotypes ABCDE. ***FY 2020 Plans:*** - Complete nonclinical efficacy and toxicology of Burkholderia OMV vaccine and subunit vaccine for advancement to clinical phase I. - 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. - Continue IND enabling development of live-attenuated tularemia vaccine. - 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. - Continue to refine correlates of immunity of next generation CPS conjugate anthrax vaccine. - Continue Burkholderia and Q fever seroprevalence studies in support of potential clinical trials, reagent generation and biomarker discovery. - Initiate Phase 1 clinical trial for multivalent monoclonal antibody cocktail. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. Program efforts are reduced due to completion of ADAMANT BoNT mAb cGMP manufacturing, investigational new drug (IND) studies, and completion of ADAMANT BoNT phase I trial planning as well as termination of rPA based anthrax vaccine development.			
Title: 4) Biosurveillance (BSV) ***Description:*** Integrate existing disparate military and civilian datasets, investigate methodologies to appropriately integrate open source data into advanced warning systems, and leverage and enhance advanced epidemiological models and algorithms for disease prediction, forecasting, impact and biological threat assessment. Contribute to the development of global, near real-time, disease monitoring and surveillance systems that address secondary infection, fuse medical syndromic, environmental, and clinical data, and feed into disease modeling, medical resource estimation and decision support tools. This program is transferring in FY19 to CB3 (Chemical Biological Defense) Threat Surveillance.	6.166	-	-
Title: 5) Diagnostic Device Platforms ***Description:*** Diagnostic device development to include systems able to harness next generation technologies to revolutionize clinical diagnostics in care facilities and in hospital laboratories. This investment will incorporate capabilities such as next generation sequencing and advanced biomolecular methods to harness both host and pathogen biomarkers in a threat agnostic approach that will serve all echelons of military medical care.	10.021	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
This program is transferring in FY19 to TM3 (Techbase Med Defense) Medical Diagnostics.			
Title: 6) Medical Countermeasures Initiative ***Description:*** 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. ***FY 2020 Plans:*** - Continue to invest in monoclonal antibodies technologies to counter threat agents both prophylactically and therapeutically; - Invest in novel expression systems, including outer membrane vesicle based bacterial expression platforms for bacterial vaccine candidates; - Invest in novel platform technologies to support medical countermeasure candidate development, including the conjugate polysaccharide based vaccine platform and the DNA vaccine platform; - Invest in technologies that support regulatory science; - Invest in animal model development to support test and evaluation of MCMs and capability to respond to emerging threats; - Support manufacturing advancements for biologics. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	-	-	20.900
Title: 7) Vaccine Platforms and Research Tools ***Description:*** 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. ***FY 2019 Plans:*** - Continue development of methods for evaluation of non-lethal symptomology and biomarkers of alphavirus infection in nonhuman primates (NHPs). - Continue development of outer membrane vesicles (OMV) and nanoparticle vaccine platforms targeting Burkholderia, Francisella and Yersinia. - Continue development of native conformation membrane protein expression and presentation system.	3.102	2.976	6.358

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue advancement of manufacturing and formulation for Venezuelan equine encephalitis virus (VEEV) and Eastern equine encephalitis virus (EEEV) for entry to clinical studies. - Continue IND enabling studies with new formulation and delivery method for VEEV, EEV and WEEV vaccine. ***FY 2020 Plans:*** - Down select and qualify biomarkers of nonlethal alphavirus disease in NHPs. - Continue assay development to qualification/validation for advanced studies. - Continue manufacturing development of OMV and nanoparticle vaccine platforms targeting Burkholderia, Francisella and Yersinia. - Initiate assay qualification for OMV vaccine in advance of clinical studies. - Continue development of native conformation membrane protein expression and presentation system. - Initiate manufacturing and development of next generation plague monoclonal antibody cocktail. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 8) Viral Therapeutics ***Description:*** Identify, optimize and evaluate potential therapeutic candidates effective against designated viral threat agents. ***FY 2019 Plans:*** - Continue small molecule and monoclonal antibody selection and evaluation in NHP models for pan-ebola/pan-filovirus and alphaviral therapeutic applications. - Continue monoclonal antibody development for broad spectrum capabilities. ***FY 2020 Plans:*** - Continue small molecule and monoclonal antibody selection and evaluation in NHP models for pan-ebola/pan-filovirus and alphaviral therapeutic applications. - Continue joint development of pan-marburg monoclonal antibody development with interagency partners. - Continue monoclonal antibody development for broad spectrum capabilities. - Continue developing core capabilities for NHP studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	4.762	9.056	15.375
Title: 9) Viral Vaccines	6.943	6.289	9.401

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: 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. ***FY 2019 Plans:*** - Complete licensure development of Zaire ebolavirus vaccine. - Continue development of an rVSV vaccine for Marburgvirus. Advance correlate of immunity validation for filovirus vaccines. - Continue manufacturing and formulation development and initiate efficacy and safety studies for advanced Alphavirus (WEVEE) vaccines. - Continue manufacturing and assay development for vesicular stomatitis virus (VSV) trivalent Filovirus vaccine with new manufacturer. - Evaluate ability of candidates to elicit sterilizing immunity in the mucosa. - Begin evaluation of candidate vaccines against arenavirus infection. ***FY 2020 Plans:*** - Complete assay qualification and validation for Ebola virus, Marburg virus, and alphavirus vaccines. - Continue formulation development of adjuvanted DNA Alphavirus vaccine and initiate efficacy studies in animal models. - Continue development of rVSV and DNA Marburg virus vaccines. - Continue evaluation of arenavirus vaccines in animal models. - Continue evaluation of rVSV Ebola vaccine duration of protection assessment. - Initiate stability and in vitro delivery studies of alphavirus DNA vaccine formulations. - Initiate evaluation of Filovirus aerosol pathology. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 10) Medical Diagnostics	-	32.532	29.056
Description: Investigate medical diagnostics ubiquitous and comprehensive against chemical and biological threats (including NTAs, pharmaceutical-based agents, and toxins) by advancing diagnostic innovations. Aligning capabilities with the FDA pipeline and lager industry to ensure medical diagnostics can rapidly adapt to emerging threats and utilize emerging technologies while harvesting and synergizing the immense volume of diagnostic data. ***FY 2019 Plans:*** - Complete high sensitivity immunoassay and protein detection platforms for clinical samples. - Continue the development of assays and technologies for biological and chemical agent detection and characterization.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue the development of a chemical diagnostic platform to diagnose exposure to chemical agents for use in forward field settings or at the point-of-need. - Continue verification and testing performance of biomarker assays and reagents for point-of-need diagnostic platforms. - Continue to optimize pipelines to improve unbiased pathogen discovery and/or detection in clinical samples. - Complete efforts and studies on host response biomarker classifiers (viral versus bacterial). - Continue incorporation of stability and pre-clinical studies for diagnostic assays in development to further support FDA pre-Emergency Use Authorization submissions. - Continue incorporation of stability and pre-clinical studies for diagnostic assays in development to further support pre-Emergency Use Authorization (EUA) submissions. - Continue multi-echelon diagnostic testing and assessments of novel point of need medical diagnostics in low resource settings and austere environments. - Initiate independent verification of sequencing protocols. - Initiate efforts to integrate or converge platform technologies to detect antimicrobial resistance/multidrug resistance. - Initiate the investigation for designing biomarker verification/validation methods and activities. - Initiate efforts to investigate the use of machine learning to develop diagnostic assays and/or predict assay erosion.			
FY 2020 Plans: Biological: - Complete development of rapid quantitative in-situ protein and gene expression platform technologies for host response. - Complete effort to develop and validate a lateral flow immunoassay for Burkholderia. - Complete optimization and enhancement of updated bioinformatics platform to support genomic and clinical (biomedical) informatics modularity. - Continue the development of diagnostic assays and technologies for biological threat agent identification, detection, and characterization. - Continue verification and testing performance of biomarker assays and reagents for point-of-need diagnostic platforms. - Continue multi-echelon diagnostic testing and assessments of novel point of need medical diagnostics in low resource settings and austere environments. - Continue to optimize pipelines to improve unbiased pathogen discovery and/or detection in clinical samples. - Continue incorporation of stability and pre-clinical studies for diagnostic assays in development to further support FDA pre-Emergency Use Authorization (pre-EUA) submissions. - Continue developing point-of-need diagnostic platforms with host biomarker diagnostic assays and testing performance. - Continue limited investigation of high sensitivity immunoassay and protein detection platforms for clinical samples in support of the development of a future protein-based diagnostic system.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue efforts to investigate the use of artificial intelligence, machine learning, or deep learning to develop diagnostic assays and/or predict assay erosion. - 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. - Initiate investigations into building a core capability at a DoD laboratory to develop the first FDA pre-Emergency Use Authorization (pre-EUA) diagnostic assay for use on a next generation sequencing platform. - Initiate establishments of pipelines, workflows, and methodologies to develop complementary diagnostics. Chemical: - Continue the development of diagnostic assays and technologies for chemical threat agent identification, detection, and characterization. - Continue the development of a chemical diagnostic platform to diagnose exposure to chemical threat agents in forward field settings or at the point-of-need. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters. This program subsumes TM3 (Techbase Med Defense) Assays and Reagents and TM3 (Techbase Med Defense) Diagnostic Device Platform in FY19.			
Title: 11) Chemical Therapeutics	0.387	1.884	2.360
Description: Focuses on therapeutic 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. ***FY 2019 Plans:*** - Employ optimized real-time microdialysis system to support therapeutic candidate analysis and development. - Continue using proof-of-concept in vivo experiments to measure neuroprotective effects of known and novel compounds. - Continue maintaining the ADMET CoE to ensure capability for development and supporting regulatory science to facilitate FDA licensure of chemical therapeutics. - Initiate advanced development of lead therapeutic candidates. ***FY 2020 Plans:*** - Complete proof-of-concept in vivo experiments to measure neuroprotective effects of known and novel compounds. - Continue using real-time microdialysis system to support therapeutic candidate analysis and development. - Continue advanced pre-clinical development of lead therapeutic candidates. ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to change in program/project technical parameters.			
Title: 12) Medical Diagnostics Response Capability Development	-	-	10.500
Description: Investigate medical diagnostics ubiquitous and comprehensive against chemical and biological threats (including] NTAs, pharmaceutical-based agents, and toxins) by advancing diagnostic innovations. Aligning capabilities with the FDA pipeline and larger industry to ensure medical diagnostics can rapidly adapt to emerging threats and utilize emerging technologies while harvesting and synergizing the immense volume of diagnostic data. ***FY 2020 Plans:*** Biological: - Continue efforts to integrate or converge platform technologies to detect antimicrobial resistance/multidrug resistance (AMR/ MDR) and pathogen identification into one platform. - Initiate the advancement of next-generation sequencing for use as a medical diagnostic capability. - Initiate the development of the In-vitro Affinity Diagnostic System (IADS) platform that will complement the currently fielded molecular-based diagnostics system. Chemical: - Initiate diagnostics capability to support Defense Laboratory Network (DLN) efforts against chemical warfare agent exposure. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. Increase for CBDP Support to Bio-Incident Response.			
Accomplishments/Planned Programs Subtotals	92.231	88.188	120.526

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MB4: *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*	71.070	65.209	48.166	-	48.166	75.343	70.991	78.526	73.550	Continuing	Continuing
• MC4: *MEDICAL CHEMICAL DEFENSE (ACD&P)*	4.666	2.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.054
• MB5: *MEDICAL BIOLOGICAL DEFENSE (EMD)*	130.240	117.331	119.227	-	119.227	97.501	71.221	78.435	82.815	Continuing	Continuing
• MC5: *MEDICAL CHEMICAL DEFENSE (EMD)*	58.419	57.545	62.051	-	62.051	64.331	56.641	28.559	26.976	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TM3 / *TECHBASE MED DEFENSE (ATD)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 3	R-1 Program Element (Number/Name) PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	Project (Number/Name) TT3 / *TECHBASE TECHNOLOGY TRANSITION*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TT3: *TECHBASE TECHNOLOGY TRANSITION*	-	11.352	10.191	10.982	-	10.982	11.011	11.004	11.003	11.001	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project TT3 validates high-risk/high-payoff technologies, concepts-of-operations, and a Joint Combat Developer concept development and experimentation process that could significantly improve Warfighter capabilities in preparation for transition of mature chemical and biological (CB) defense technologies to advanced development programs.

Individual efforts in this project include:
- These programs offer the opportunity to identify and efficiently mature emerging technologies, reduce risks, and finalize engineering and integration efforts.
- These programs seek to demonstrate the potential for enhanced military operational capability and/or cost effectiveness. Upon conclusion of the technical and operational demonstrations, the user or sponsor provides a determination of the military utility and operational impact of the technology and capability demonstrated. Successfully demonstrated technologies with proven military utility can remain in place for future extended user evaluations, accepted into the advanced stages of the formal acquisition process, proceed directly into limited or full- scale production or be returned to the technical base for further development.
- This project addresses the four primary thrust areas of Sense, Shape, Shield, and Sustain, with an emphasis on Integrated Early Warning. Integrated Early Warning is conducted through a coordinated program approach focused on layering Chemical and Biological Detection technologies and integrating CB threat indicators to provide combination of awareness and understanding that facilitates effective (timely) decision making so the force can continue military operations and achieve mission success in a CBRN environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Experiment & Technology Demonstrations	11.352	10.191	10.982
Description: Utilize Concept Experimentation, Warfighter Utility Assessments and Advanced Technology Demonstrations (ATDs) to demonstrate the maturity and potential of advanced technologies across the Sense/Shape/ Shield/Sustain spectrum for enhanced military operational capability or cost effectiveness.			
FY 2019 Plans: - 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 as part of the second phase of the comprehensive early warning ATD. Demonstrate integration of wearable sensors as part of the comprehensive early warning ATD. To be integrated on CBRN Sensor Integration on Robotic Platforms (CSIRP). Demonstrate prototype end-to-end early warning capability at an OCONUS area of responsibility.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 3	**R-1 Program Element (Number/Name)** PE 0603384BP / *CHEMICAL/BIOLOGICAL DEFENSE (ATD)*	**Project (Number/Name)** TT3 / *TECHBASE TECHNOLOGY TRANSITION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue transition activities with advanced development and associated JPM program efforts supporting the CBDP IEW focus area. - Continue to conduct Rapid Military Utility Assessments (RMUAs) and field experiments to assess early technology capability contributions, in collaboration with the CBDP Joint Combat Developer. - Continue Demonstration Concept Development and Experimentation activities in support of Early Warning and Integrated & Layered Defense. ***FY 2020 Plans:*** - 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 JPEO CBRN Sensor as part of the second phase of the comprehensive early warning ATD. To be integrated on CBRN Sensor Integration on Robotic Platforms (CSIRP). Demonstrate integration of wearable sensors as part of the comprehensive early warning ATD. Demonstrate service specific prototype end-to-end early warning capability at an OCONUS area of responsibility. - Continue transition activities with advanced development and associated JPM program efforts supporting the CBDP IEW focus area. - Continue to conduct Warfighter Utility Assessments to assess early technology capability contributions, in collaboration with the CBDP Joint Combat Developer. - Continue concept experimentation activities in support of Early Warning and Integrated & Layered Defense. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	11.352	10.191	10.982

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	135.322	115.886	83.662	-	83.662	101.792	95.322	103.284	96.769	Continuing	Continuing
CA4: *CONTAMINATION AVOIDANCE (ACD&P)*	-	30.844	31.527	19.074	-	19.074	8.864	8.215	15.106	13.706	Continuing	Continuing
DE4: *DECONTAMINATION SYSTEMS (ACD&P)*	-	9.888	6.117	8.735	-	8.735	10.258	9.511	6.044	5.905	Continuing	Continuing
IP4: *INDIVIDUAL PROTECTION (ACD&P)*	-	4.421	3.228	1.997	-	1.997	1.997	2.994	0.000	0.000	0.000	14.637
IS4: *INFORMATION SYSTEMS (ACD&P)*	-	5.336	0.854	0.528	-	0.528	0.174	0.070	0.067	0.067	Continuing	Continuing
MB4: *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*	-	71.070	65.209	48.166	-	48.166	75.343	70.991	78.526	73.550	Continuing	Continuing
MC4: *MEDICAL CHEMICAL DEFENSE (ACD&P)*	-	4.666	2.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.054
TE4: *TEST & EVALUATION (ACD&P)*	-	9.097	6.563	5.162	-	5.162	5.156	3.541	3.541	3.541	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 CBR contamination and prevent further cross-contamination during operations.

- Decontamination Systems (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.

- 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.

- Information Systems (IS4): component development and prototyping of information architectures and applications for shaping the battlespace against CBRN threats.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*

- 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.

- 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.

- Test and Evaluation (TE4): critical test capabilities, planning, and infrastructure improvements/modifications necessary to evaluate Chemical, Biological, Radiological, and Nuclear (CBRN) Defense systems in realistic operating environments.

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.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	148.518	129.886	81.757	-	81.757
Current President's Budget	135.322	115.886	83.662	-	83.662
Total Adjustments	-13.196	-14.000	1.905	-	1.905
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-9.925	-14.000			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.402	-			
• SBIR/STTR Transfer	-2.869	-			
• Other Adjustments	0.000	-	1.905	-	1.905

Change Summary Explanation

Funding: FY18 (-$9.925M): Congressional Directed Reductions.
FY18 ((-$.402M): Reprogramming adjustments to balance overall portfolio efforts.
FY18 (-$2.869M): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY19 (-$14.000M): Congressional Directed Reductions.

FY20 (+$8.000M): Program Increase for Advanced Development and Manufacturing (ADM) Capability Development.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603884BP *I CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*

FY20 (-$6.095M): Program adjustments to balance overall portfolio efforts and resource Services highest priority detection, protection, and MCM development efforts in BA5.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*				Project (Number/Name) CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
CA4: *CONTAMINATION AVOIDANCE (ACD&P)*	-	30.844	31.527	19.074	-	19.074	8.864	8.215	15.106	13.706	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) Next Generation Chemical Detector (NCGD 4)
(2) Wearable Chemical Agent Detector (WCAD) (formerly Next Generation Chemical Detector (NGCD) 4)
(3) Biosurveillance (BSV)
(4) CBRN Sensor Integration on Robotics Platforms (CSIRP)
(5) Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets (CBRN DRS)
(6) Enhanced Capability Demonstration Integrated Early Warning (ECD IEW)
(7) Enhanced Capability Demonstration Joint Chemical Biological Radiological Nuclear Advanced Capability Sets (ECD JCACS)
(8) Non-Traditional Agent (NTA) Defense, and
(9) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA).

The WCAD (formerly known as NGCD 4) 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. In FY20, WCAD is aligned with CSIRP to identify and develop chemical sensors for unmanned applications.

BSV programs provide a set of capabilities that acquire, integrate, and analyze medical, environmental, and incident management data using existing and next generation systems, medical and non-medical sample collection tools and identifiers/diagnostics. 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.

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 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.

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). 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) NGCD 4 (Next Generation Chemical Detector) ***Description:*** Program testing and support	0.550	-	-
Title: 2) Wearable Chemical Agent Detector (WCAD) ***Description:*** Program Management and technology assessment ***FY 2019 Plans:*** Initiate and complete evaluation efforts from previous work under NGCD 4. This includes technology readiness evaluations, table top exercises and modeling & simulation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to fact of life change in the program/project.	-	0.443	-
Title: 3) BSV ***Description:*** CENTAUR ***FY 2019 Plans:*** Continue to support efforts and overall transition of technologies to programs of record. Supports program management, AED, EW, BSP, BICS and systems engineering to ensure integration across residual capabilities for Assessment of Environmental Detectors (AED), Early Warning (EW), Biosurveillance Portal (BSP) and Biological Identification Capabilities Sets (BICS) within the USFK. ***FY 2020 Plans:*** Complete CENTAUR efforts. Transition residual capabilities to support 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)). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is entering completion and all activities will be closed.	-	6.432	0.397
Title: 4) BSV ***Description:*** CENTAUR residual capability and operational demonstration test support ***FY 2019 Plans:*** Continue to provide residual capability (through contractor logistics support) and operational demonstration test support for AED,	15.018	3.500	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
EW, BSP and BICS for CENTAUR. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is entering completion and all activities will be closed.			
Title: 5) CBRN Sensor Integration on Robotic Platforms (CSIRP) ***Description:*** Product Development ***FY 2019 Plans:*** Initiate sensor integration efforts for unmanned ground and air platforms, and mission modeling efforts. Initiate size, weight, and power trade studies for sensor integration. Purchase developmental test articles. Initiate unmanned technology demonstrations and provide support to test events requiring robotic platforms. Coordinate demonstrations by prototype vendors and end users evaluating the capabilities, reliability and usability of the integrated sensors onto the Unmanned Air Systems (UAS) and Unmanned Ground Systems (UGS). ***FY 2020 Plans:*** 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 prototype vendors and end users evaluating the capabilities, reliability and usability of the integrated sensors onto the UAS and UGS. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to accelerated development effort.	-	2.496	6.139
Title: 6) CBRN Sensor Integration on Robotic Platforms (CSIRP) ***Description:*** Program Management ***FY 2019 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	2.504	1.848

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to accelerated development effort.			
Title: 7) CBRN DRS ***Description:*** Provide Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets Advanced Capability Set (CBRN DRS 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. ***FY 2019 Plans:*** Assess potential materiel solutions to meet requirement capabilities, and continue to provide program management support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred to another funding line. The technology upgrade and refresh effort for CBRN DRS transitions from CA4 to CA7.	0.835	0.500	-
Title: 8) ECD IEW ***Description:*** Early Warning common CBRN architecture development and capability integration. ***FY 2019 Plans:*** Continue Early Warning capability integration for remote CBRN and Non-CBRN sensors and decision support. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	3.453	3.117	2.975
Title: 9) ECD IEW ***Description:*** Early Warning capability RDT&E test article procurement and assessment. ***FY 2019 Plans:*** Continue Early Warning capability RDT&E test article procurement and assessment. ***FY 2020 Plans:*** Complete Early Warning capability RDT&E test article procurement and assessment for fixed site operational units. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.000	0.750	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Decrease due to change in program/project technical parameters.			
Title: 10) ECD IEW AIM ***Description:*** The Hybrid Accelerator effort is to facilitate the necessary technical and subject matter expert (SME) support to enable event/project-based prototyping, concept exploration and divergent and innovative collaboration for USSOCOM emerging challenges.	1.000	-	-
Title: 11) ECD JCACS ***Description:*** Product Development ***FY 2019 Plans:*** Initiate and complete award for prototype construction and testing, provide support to CSIRP test events requiring robotic platforms, support IEW remote sensing data requirements. Initiate and complete integration efforts for unmanned air and ground platforms, complete mission modeling efforts. Initiate and complete size, weight and power trade studies on sensor integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is entering completion and all activities will be closed.	6.489	7.299	-
Title: 12) ECD JCACS ***Description:*** Program Management ***FY 2019 Plans:*** Initiate and complete Program Management support including Government system engineering, program/financial management, costing, personnel labor, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is entering completion and all activities will be closed.	-	1.285	-
Title: 13) ECD JCACS ***Description:*** Residual Equipment Sustainment ***FY 2020 Plans:*** Initiate and complete a list of residual equipment and provide sustainment support of that residual equipment to include material, maintenance labor and training. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	1.923

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program/project is entering completion and all activities will be closed.			
Title: 14) NTA Defense ***Description:*** NTA Defense program provides assessment and improvement of detection, protection, and decontamination capabilities to protect the Joint Services against emerging threats, to include PBAs. Specific efforts include: assessment of technologies and prototyping for rapid fielding to the Joint Services; sharing of classified and unclassified data, information, and knowledge regarding PBAs and emerging threats. Efforts seek to minimize duplication of effort and maximize cost-sharing opportunities across the whole of government and with international partners. ***FY 2019 Plans:*** Continue analysis of operationally-relevant threat composition and presentation to inform the assessment of capabilities against PBAs. Continue to conduct market surveys and assessments of technologies for rapid fielding of CBDP capabilities. Invest in technology prototyping and assessment to provide capability improvements. Conduct capability trade off analyses to inform acquisition decisions pertaining to PBAs. Continue work with interagency and international partners to establish a FOUO data portal for sharing PBA information. ***FY 2020 Plans:*** Leverage expanded requirements to broaden FY18-19 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/ preparation and decontamination against PBAs. Expand classified NTA Data Library and FOUO PBA data portal with newly available data to ensure widest dissemination possible. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to accelerated development effort.	0.802	1.534	3.258
Title: 15) NTA Defense support for Threat Agent Characterization ***Description:*** 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 Chemical Biological Defense Program (CBDP) partners, as well as with other nations, under the Chemical Biological Radiological Memorandum of Understanding (CBR MOU).	0.405	-	-
Title: 16) NTA Defense ***Description:*** Program Management ***FY 2019 Plans:***	1.292	1.172	2.034

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 17) ROSETTA ***Description:*** Provide system engineering design and program management ***FY 2019 Plans:*** Initiate development of colorimetric sensor, prepare contract package and test planning for prototype testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	-	0.495	-
Accomplishments/Planned Programs Subtotals	30.844	31.527	19.074

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CA5: *CONTAMINATION AVOIDANCE (EMD)*	95.134	111.781	131.985	-	131.985	75.093	53.146	38.807	38.987	Continuing	Continuing
• JF0100: *JOINT CHEMICAL AGENT DETECTOR (JCAD)*	4.483	1.698	4.493	-	4.493	6.828	7.574	8.197	8.368	Continuing	Continuing
• JX0300: *BIOSURVEILLANCE (BSV)*	18.188	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.188
• MC0100: *JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)*	0.468	0.000	0.300	-	0.300	0.300	0.300	7.981	7.981	Continuing	Continuing
• MC0101: *CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)*	69.945	98.081	53.020	-	53.020	45.344	50.798	55.510	43.067	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MX0001: *JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)*	0.000	0.000	0.000	-	0.000	47.915	50.785	65.244	60.849	Continuing	Continuing

Remarks

D. Acquisition Strategy

NEXT GENERATION CHEMICAL DETECTOR (NGCD)

NGCD used Full and Open competition to award Technology Maturation and Risk Reduction (TMRR) contracts. In FY18 NGCD 4 awarded a wearable technology assessment (WTA) contract to provide brassboard and breadboard prototypes for Government evaluation. Beginning in FY19 NGCD BA4 will be renamed WCAD.

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 OGA stakeholders and industry to inform documentation decisions and program decisions.

BIOSURVEILLANCE (BSV)

BSV will utilize residual capabilities from CENTAUR. With the Close out of CENTAUR at Busan Pier 8, BSV will transition and integrate successful technologies into a baseline IEW framework, to support 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 Transactional Agreements (OTA) and procurement contracts. Completion of the effort will serve as a baseline configuration for IEW efforts with in the CBDP, technologies, lessons learned, test data, will be transitioned to the programs of record associated with the CBDP (such as IEW ECD, EMBD, NGDS, JBTDS & Common Analytical Laboratory System (CALS)).

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 payloads in 2 year capability sets based on service requirements. The 2 year capability sets will utilize a streamlined acquisition process in order to keep pace with industry and the rapid advancement of technologies. CSIRP strategy is to utilize the rapid prototyping process enabled by the Other Transactional Agreements (OTA) contract vehicle.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

Upon award, the awardees will have up to two years to produce 10 working prototype sensors that are integrated onto service chosen (air and/or land) 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.

CBRN DISMOUNTED RECONNAISSANCE SYSTEMS

The Chemical Biological Radiological Nuclear, Dismounted Reconnaissance Sets (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 DTRA IEW ATD, JUPITR 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.

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 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 work together with CSIRP to 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 for PBAs and other emerging threats into existing and future acquisition programs (PORs, ECD/ACDs, and Accelerated Acquisition) and utilize a variety of contract mechanisms (full and open competition, existing task order contracts within DoD).

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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - HW C - NGCD4-Modeling and Simulation (M&S)	MIPR	Institute for Defense Analysis (IDA) : Alexandria, VA	0.000	0.099	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW C - NGCD4-Table Top Exercise	MIPR	STRATCOM : Omaha, NE	0.000	0.133	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - HW C - Chemical and Biological Sensor Integration	C/CPFF	TBD : TBD	0.000	0.000		2.000	Jan 2019	2.789	Dec 2019	-		2.789	Continuing	Continuing	0.000
CSIRP - HW C - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		1.712	Jan 2019	0.650	Oct 2019	-		0.650	Continuing	Continuing	0.000
CBRN DRS - Non Intrustive Detection Support	Various	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.221	Nov 2017	0.077	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - AIM	C/FFP	TBD : TBD	0.000	0.980	Oct 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ECD JCACS - HW C - Product Development	MIPR	Various : Various	0.000	3.447	Mar 2018	5.000	Mar 2019	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW C - Product Contractor Development Team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.000	0.090	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Technology Assessments	MIPR	Various : Various	0.167	0.000		0.263	Dec 2018	0.436	Dec 2019	-		0.436	Continuing	Continuing	0.000
NTA DEFENSE - NHW S - Threat Understanding	MIPR	Various : Various	0.476	0.111	Mar 2018	0.340	Dec 2018	0.955	Dec 2019	-		0.955	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Systems Engineering	MIPR	Various : Various	0.436	0.000		0.400	Dec 2018	0.465	Dec 2019	-		0.465	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Strategic Coordination/ Data Sharing	C/CPFF	Various : Various	0.174	0.289	Nov 2017	0.269	Dec 2018	0.500	Dec 2019	-		0.500	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NTA DEFENSE - HW S - Government SE & Techncial Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.758	Nov 2017	0.773	Dec 2018	1.240	Dec 2019	-		1.240	Continuing	Continuing	0.000
		Subtotal	1.253	6.128		10.834		7.035		-		7.035	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSV - TD/D C -BSP - JACCS/BSP integration development	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	4.049	0.538	Jan 2018	0.684	Jan 2019	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	3.863	5.138	Jan 2018	2.223	Jan 2019	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	4.644	1.266	Jan 2018	1.326	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
BSV - ES S - Early Warning sustainment costs for software package	MIPR	Various : Various	7.529	6.457	Jan 2018	3.709	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - HW/SW Sensor Interface Design and Concept Development	Various	Various : Various	0.000	0.000		0.096	Dec 2018	1.550	Feb 2020	-		1.550	Continuing	Continuing	0.000
CBRN DRS - ES C Market Analysis	Various	Various : Various	0.000	0.522	Nov 2017	0.348	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - AIM Travel	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.020	Oct 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ECD IEW - Acquisition, Integration and decision tool demonstration	C/CPFF	TBD : TBD	0.000	1.355	Aug 2018	1.617	Jan 2019	1.475	Jan 2020	-		1.475	Continuing	Continuing	0.000
ECD IEW - System Integration	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.500	Jan 2018	0.200	Jan 2019	0.200	Jan 2020	-		0.200	Continuing	Continuing	0.000
ECD JCACS - ES C - Support Costs	MIPR	Various : Various	0.000	0.000		0.899	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - ES S - Technology Assessments/ Threat Understanding	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.115	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	20.085	15.911		11.102		3.225		-		3.225	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - NGCD 4 Technology Readiness Evaluation (TRE)	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.218	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSV - DTE S - Developmental Testing, Operational Assessment, Busan Event	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	2.494	0.000		0.750	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CSIRP - Integration, Operational Demonstrations and Evaluation Services - ATEC	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.000		0.400	Apr 2019	1.800	Mar 2020	-		1.800	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ECD IEW - TTX & OP DEMOs	MIPR	Various : Various	0.000	1.000	Jan 2018	0.750	Jan 2019	0.500	Jan 2020	-		0.500	Continuing	Continuing	0.000
ECD JCACS - DTE - Test and Evaluation	MIPR	Various : Various	0.000	1.689	Apr 2018	1.400	Apr 2019	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Technology Assessments	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.262	Dec 2018	0.436	Jan 2020	-		0.436	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Threat Understanding	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.263	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Systems Engineering	MIPR	Various : Various	0.000	0.000		0.000		0.466	Jan 2020	-		0.466	Continuing	Continuing	0.000
NTA DEFENSE - OTE S - International Novel Threat Agent Characterization Trials (INTACT)	C/CPFF	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.000	0.405	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ROSETTA - DTE C - Technology Readiness Assessment	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.360	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	2.494	3.575		3.922		3.202		-		3.202	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - NGCD4 Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	33.504	0.100	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
WCAD - PM/MS C - Management Support	MIPR	Various : Various	0.000	0.000		0.357	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
WCAD - PM/MS S - Wearable Chemical Agent Detector (WCAD)	MIPR	TBD : TBD	0.000	0.000		0.086	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
BSV - PM/MS S - BMO Labor & Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.810	0.671	Jan 2018	0.735	Jan 2019	0.236	Jan 2020	-		0.236	Continuing	Continuing	0.000
BSV - PM/MS S - ECBC ATD Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.716	0.948	Jan 2018	0.505	Jan 2019	0.161	Jan 2020	-		0.161	Continuing	Continuing	0.000
CSIRP - Project Management	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.792	Dec 2018	1.198	Dec 2019	-		1.198	Continuing	Continuing	0.000
CBRN DRS - CBRN DRS ACS - PM/MS-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.092	Mar 2018	0.075	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
ECD IEW - ECBC ECD Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.348	Jan 2018	0.200	Jan 2019	0.200	Jan 2020	-		0.200	Continuing	Continuing	0.000
ECD IEW - ECBC Matrix Govt labor	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.500	Jan 2018	0.350	Jan 2019	0.350	Jan 2020	-		0.350	Continuing	Continuing	0.000
ECD IEW - Labor and Travel Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.750	Jan 2018	0.750	Jan 2019	0.750	Jan 2020	-		0.750	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ECD JCACS - PM-Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	1.353	Dec 2017	1.285	Dec 2018	1.923	Jan 2020	-		1.923	Continuing	Continuing	0.000
NTA DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.841	0.468	Dec 2017	0.399	Dec 2018	0.794	Dec 2019	-		0.794	Continuing	Continuing	0.000
ROSETTA - PM/MS C	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000	Nov 2017	0.135	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	35.871	5.230		5.669		5.612		-		5.612	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	59.703	30.844		31.527		19.074		-		19.074	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

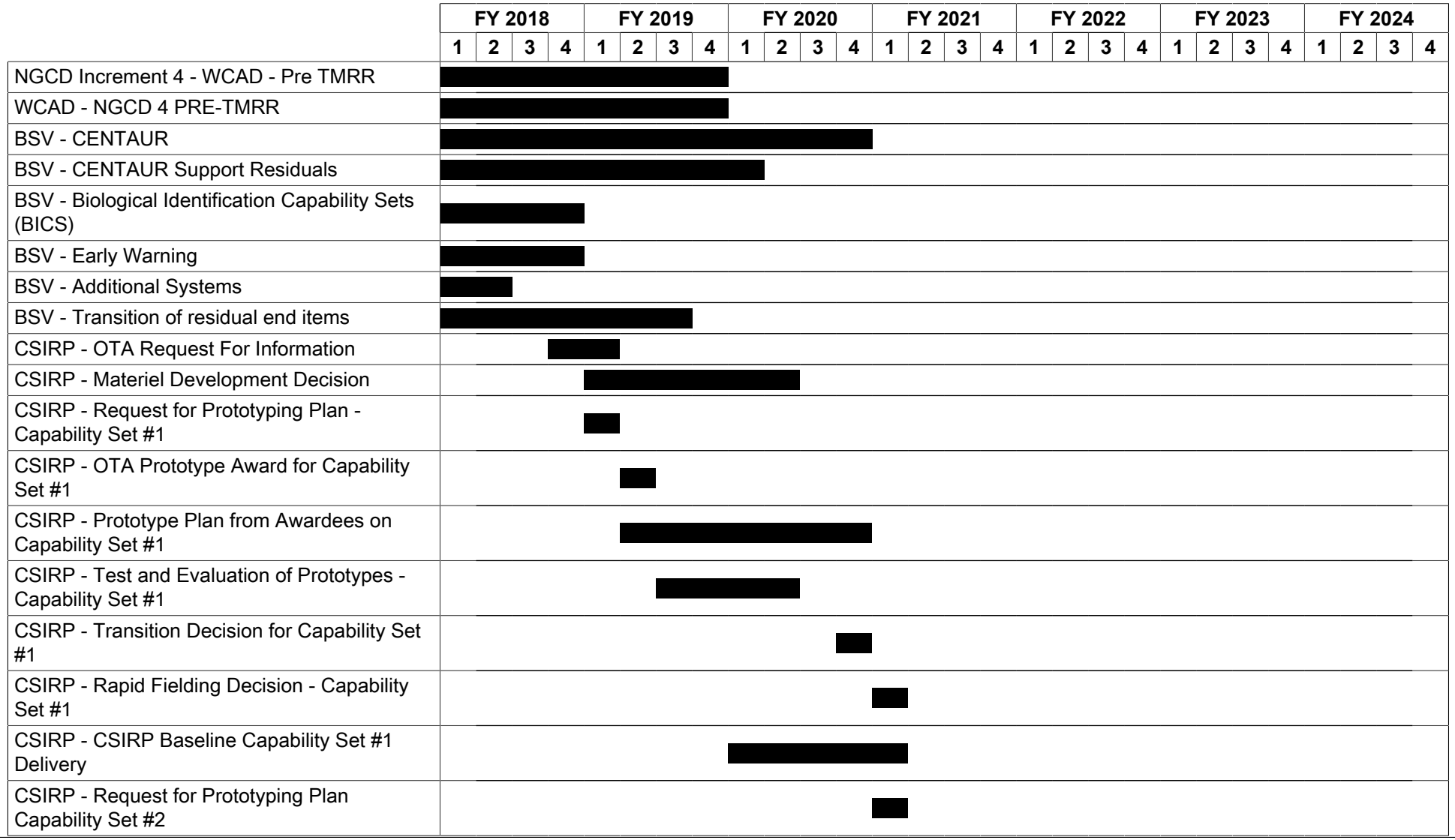

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

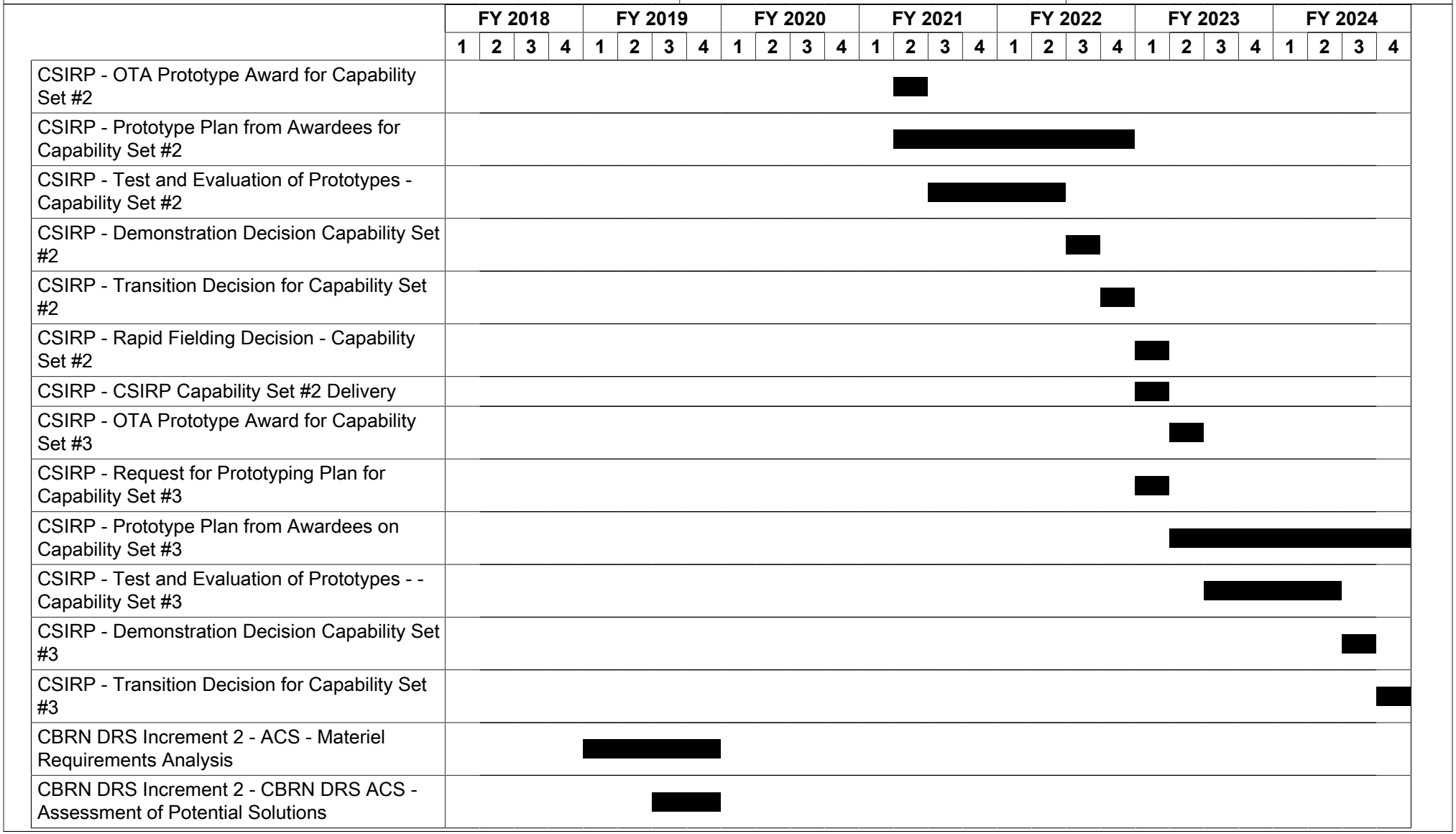

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

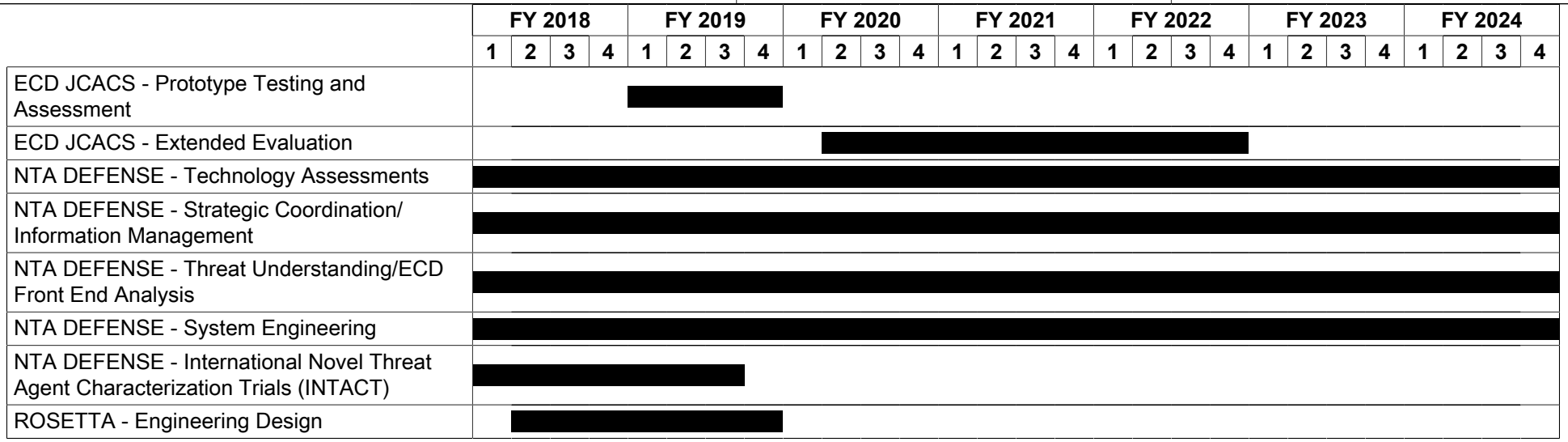

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
NGCD Increment 4 - WCAD - Pre TMRR	1	2018	4	2019
WCAD - NGCD 4 PRE-TMRR	1	2018	4	2019
BSV - CENTAUR	1	2018	4	2020
BSV - CENTAUR Support Residuals	1	2018	1	2020
BSV - Biological Identification Capability Sets (BICS)	1	2018	4	2018
BSV - Early Warning	1	2018	4	2018
BSV - Additional Systems	1	2018	2	2018
BSV - Transition of residual end items	1	2018	3	2019
CSIRP - OTA Request For Information	4	2018	1	2019
CSIRP - Materiel Development Decision	1	2019	2	2020
CSIRP - Request for Prototyping Plan - Capability Set #1	1	2019	1	2019
CSIRP - OTA Prototype Award for Capability Set #1	2	2019	2	2019
CSIRP - Prototype Plan from Awardees on Capability Set #1	2	2019	4	2020
CSIRP - Test and Evaluation of Prototypes - Capability Set #1	3	2019	2	2020
CSIRP - Transition Decision for Capability Set #1	4	2020	4	2020
CSIRP - Rapid Fielding Decision - Capability Set #1	1	2021	1	2021
CSIRP - CSIRP Baseline Capability Set #1 Delivery	1	2020	1	2021
CSIRP - Request for Prototyping Plan Capability Set #2	1	2021	1	2021
CSIRP - OTA Prototype Award for Capability Set #2	2	2021	2	2021
CSIRP - Prototype Plan from Awardees for Capability Set #2	2	2021	4	2022
CSIRP - Test and Evaluation of Prototypes - Capability Set #2	3	2021	2	2022
CSIRP - Demonstration Decision Capability Set #2	3	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** CA4 / *CONTAMINATION AVOIDANCE (ACD&P)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CSIRP - Transition Decision for Capability Set #2	4	2022	4	2022
CSIRP - Rapid Fielding Decision - Capability Set #2	1	2023	1	2023
CSIRP - CSIRP Capability Set #2 Delivery	1	2023	1	2023
CSIRP - OTA Prototype Award for Capability Set #3	2	2023	2	2023
CSIRP - Request for Prototyping Plan for Capability Set #3	1	2023	1	2023
CSIRP - Prototype Plan from Awardees on Capability Set #3	2	2023	4	2024
CSIRP - Test and Evaluation of Prototypes - - Capability Set #3	3	2023	2	2024
CSIRP - Demonstration Decision Capability Set #3	3	2024	3	2024
CSIRP - Transition Decision for Capability Set #3	4	2024	4	2024
CBRN DRS Increment 2 - ACS - Materiel Requirements Analysis	1	2019	4	2019
CBRN DRS Increment 2 - CBRN DRS ACS - Assessment of Potential Solutions	3	2019	4	2019
ECD JCACS - Prototype Testing and Assessment	1	2019	4	2019
ECD JCACS - Extended Evaluation	2	2020	4	2022
NTA DEFENSE - Technology Assessments	1	2018	4	2024
NTA DEFENSE - Strategic Coordination/Information Management	1	2018	4	2024
NTA DEFENSE - Threat Understanding/ECD Front End Analysis	1	2018	4	2024
NTA DEFENSE - System Engineering	1	2018	4	2024
NTA DEFENSE - International Novel Threat Agent Characterization Trials (INTACT)	1	2018	3	2019
ROSETTA - Engineering Design	2	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*				Project (Number/Name) DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
DE4: *DECONTAMINATION SYSTEMS (ACD&P)*	-	9.888	6.117	8.735	-	8.735	10.258	9.511	6.044	5.905	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.

Efforts included in this Project are:
(1) Contaminated Human Remains System (CHRS)
(2) Tactical Disablement System (TACDS)
(3) Mass Personnel Decontamination (MPD).

The CHRS Program is based on capability gaps identified within both the Contamination Mitigation Initial Capabilities Document (ICD), dated March 2011, and the Mortuary Affairs ICD, dated October 2008. The program consists of two capabilities that will allow for the mitigation of chemical, biological and radiological contaminants in order to safely repatriate DOD-affiliated personnel back to the United States for final interment. The two capabilities identified within the ConMit Initial Capabilities Document: a Contaminated Human Remains Transfer Case (CHRT) packaging solution to safely repatriate chemical, biological, or radiological contaminated human remains to the Continental United States and a sustainable Contaminated Remains Mitigation System (CRMS) to reduce the hazard to warfighters by decontaminating chemical, biological, or radiological contaminated human remains. CRMS was previously known as Contaminated Human Remains Decontamination System (CHRDS). 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 CRMS is a system of tents, plumbing, generators, and medical equipment necessary to establish a decontamination site to perform decontamination, identification, and packaging of contaminated human remains for further disposition. The CRMS will reduce the hazards associated with contaminated human remains through decontamination of remains and enable positive identification of remains for the Armed Forces Medical Examiner before packaging in a CHRT. The CRMS efforts will continue in FY19 under the MPD funding line.

The TacDS, to be developed as a Family of Systems (FoS), will provide a tactical commander 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 in a hostile operational environment. C/BMOC consists of Chemical Warfare Agents (CWA), Biological Warfare Agents (BWA), Non-Traditional Agents (NTA), as well as precursors. The TacDS will operate in locations both remote and accessible, during hostile and non-hostile conditions, and within time periods of minutes to hours, to reduce the employability of C/BMOC against the joint force and/or prevent proliferation to other actors of concern. TacDS is a new capability for the Department of Defense addressing multiple capability gaps.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

The MPD program is an FY19 new start intended to correct capability gaps identified within the Consequence Management ICD, dated 14 October 2010. 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) CHRS ***Description:*** Contaminated Human Remains Transfer Case (CHRT) Development and Support ***FY 2019 Plans:*** Complete Manufacturing Readiness Assessment and conduct Critical Design Review. Complete Developmental Testing and Operational Test Agency assessment Report (AOR) in preparation for an In Process Review. Validate and verify the Technical Manual, conduct Logistics Demonstration, and conduct Operational Testing (OT). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	3.432	2.319	-
Title: 2) CHRS ***Description:*** Contaminated Human Remains Transfer Case (CHRT) Prototypes ***FY 2019 Plans:*** Award contract to procure (30) production representative prototypes that will be destroyed in Operational Testing at a cost of $10k each. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	1.317	0.300	-
Title: 3) CHRS ***Description:*** Contaminated Remains Mitigation System (CRMS) Prototypes	1.923	-	-
Title: 4) CHRS ***Description:*** Contaminated Remains Mitigation System (CRMS) Technology Development and Support	0.535	-	-
Title: 5) TacDS ***Description:*** Prototype Development and Evaluation ***FY 2019 Plans:***	2.681	3.004	3.819

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Conduct initial prototyping and evaluation for 1st product. Design / coordinate product-specific plans and develop product specific TEMP annex for first product to support TacDS T&E efforts. Initiate development of prototyping efforts for second TacDS product. ***FY 2020 Plans:*** Continue prototyping efforts and evaluation of TacDS products. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 6) MPD ***Description:*** MPD MS A Support and Preliminary Systems Component Testing ***FY 2019 Plans:*** Begin product development of MPD systems to support achievement of MS A decision. ***FY 2020 Plans:*** Award contract to purchase prototype systems components (generators, heat pumps, roller systems, and spray bars) for Developmental Testing. Conduct Preliminary Systems Component Testing, Systems Readiness Review, Technology Readiness Assessment and Manufacturing Readiness Assessment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to accelerated development effort.	-	0.494	4.916
Accomplishments/Planned Programs Subtotals	9.888	6.117	8.735

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• DE5: *DECONTAMINATION SYSTEMS (EMD)*	10.162	14.049	8.267	-	8.267	10.260	11.094	19.285	17.769	Continuing	Continuing
• JD0050: *DECONTAMINATION FAMILY OF SYSTEMS (DFoS)*	3.447	13.035	17.050	-	17.050	10.851	9.063	11.692	16.815	Continuing	Continuing
• JD0070: *JOINT BIOLOGICAL AGENT DECONTAMINATION SYSTEM (JBADS)*	0.917	1.000	24.608	-	24.608	2.373	0.838	1.361	0.000	0.000	31.097

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

D. Acquisition Strategy

CONTAMINATED HUMAN REMAINS SYSTEM (CHRS)

The CHRS Program will leverage existing efforts under a Joint Urgent Operational Needs Statement which has accelerated the CHRT project. Additional minor design modifications, developmental and operational testing is planned as part of the overall acquisition strategy. Product development will consist of the design and prototyping of a CHRT. The contracting strategy will make use of The Combatting Weapons of Mass Destruction (CWMD) Other Transaction Agreement (OTA) to procure prototype units, followed by Developmental Testing (DT).

Following DT completion, an Operational Test Agency Assessment report will be prepared and an In Process Review will be conducted to determine readiness to proceed to production and Operational Testing. A Logistics Demonstration and Operational Testing will be conducted. An Operational Test Agency Evaluation Report will be written, and technical reviews will be conducted, in preparation for a Milestone C/Full Rate Production decision.

TACTICAL DISABLEMENT SYSTEM (TACDS)

Utilizing mature technologies, the TACDS program will take an incremental approach towards the development, integration, test and production of a family of systems (FoS). Developmental efforts in the Technology Maturation and Risk Reduction Phase (TMRR) and the Engineering and Manufacturing Development Phase (EMD) will be contracted through full and open competition. Production and Deployment will also be competed through full and open competition.

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, and includes efforts for the reduction of current MPD System sustainment costs by assessing existing MCD equipment and processes as well as new technology through the use of Request For Information from Industry's (RFI's), Market Research Analyses and Technology Demonstrations. A competitive/sole source contract for prototyping and production units will be awarded so that a combined developmental and operational testing can be performed on those assets. In-Process Review will take place 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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - HW S - CHRT - Prototypes	C/FFP	Advanced Technologies International : Summerville, SC	0.000	1.317	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CHRS - HW S - CHRT - Prototype Production Representative Assests	C/FFP	TBD : TBD	0.000	0.000		0.300	Jun 2019	0.000		-		0.000	Continuing	Continuing	0.000
CHRS - HW S - CRMS - Prototypes	C/FFP	Advanced Technologies International : Summerville, SC	0.000	1.174	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CHRS - HW S - CRMS - Prototype	C/FFP	Advanced Technologies International : Summerville, SC	0.000	0.749	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
TACDS - HW S - Prototype Development	C/CPIF	TBD : TBD	0.000	1.155		0.853	Nov 2018	2.129	Nov 2019	-		2.129	Continuing	Continuing	0.000
MPD - HW S - Hardware System	C/FFP	TBD : TBD	0.000	0.000		0.000		1.494	Jan 2020	-		1.494	Continuing	Continuing	0.000
		Subtotal	0.000	4.395		1.153		3.623		-		3.623	Continuing	Continuing	N/A

Remarks

CHRS: Contaminated Remains Mitigation System (CRMS) previously known as Contaminated Human Remains Decontamination System (CHRDS). The CRMS portion of CHRS will be addressed by the Mass Personnel Decontamination (MPD) Program beginning in FY19.; MPD: Mass Personnel Decontamination funding cost increase in FY20 will provide for a contract award for Production Development efforts of prototype components (generators, heat pumps, roller systems, and spray bars),and program support.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.376	1.809	Nov 2017	1.120	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TACDS - TD/D S - Program Support Costs	Various	JPM Guardian : Aberdeen Proving Ground, MD	0.000	1.402		0.649	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
MPD - ES SB - Eng Support Subsystem IPT Support	Various	Various : Various	0.000	0.000		0.393	Jan 2019	1.904	Nov 2019	-		1.904	Continuing	Continuing	0.000
		Subtotal	0.376	3.211		2.162		1.904		-		1.904	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - Developmental Testing - CHRT	Various	Various : Various	0.000	0.764	May 2018	0.367	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CHRS - CHRS - Operational Testing - CHRT	MIPR	Operational Test Command (OTC) : Ft. Hood, TX	0.000	0.000		0.300	Jun 2019	0.000		-		0.000	Continuing	Continuing	0.000
CHRS - IPT Test Planning - CRMS	Various	TBD : TBD	0.000	0.070		0.000		0.000		-		0.000	Continuing	Continuing	0.000
TACDS - DTE C - Prototype Proof of Concept	MIPR	TBD : TBD	0.000	0.000		0.336	Feb 2019	0.000		-		0.000	Continuing	Continuing	0.000
MPD - DTE SB - Preliminay System Components Testing	Various	TBD : TBD	0.000	0.000		0.000		0.500	Jan 2020	-		0.500	Continuing	Continuing	0.000
MPD - OTHT S - IPT ComponentsTest Planning	MIPR	TBD : TBD	0.000	0.000		0.000		0.050	Dec 2019	-		0.050	Continuing	Continuing	0.000
		Subtotal	0.000	0.834		1.003		0.550		-		0.550	Continuing	Continuing	N/A

Remarks

Contaminated Remains Mitigation System (CRMS) previously known as Contaminated Human Remains Decontamination System (CHRDS). The CRMS portion of CHRS will be addressed by the Mass Personnel Decontamination (MPD) Program beginning in FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.124	1.324	Nov 2017	0.408	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CHRS - PM/MS C - DASD Reduction	Various	TBD : TBD	0.000	0.000		0.124	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
TACDS - PM/MS S - Management	MIPR	Various : Various	0.000	0.124	Oct 2017	1.166	Dec 2019	1.690	Dec 2020	-		1.690	Continuing	Continuing	0.000
MPD - PM/MS C - DASD Reduction	Various	TBD : TBD	0.000	0.000		0.024	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
MPD - PM/MS S - Management and Technical Support	MIPR	Various : Various	0.000	0.000		0.077	Jan 2019	0.968	Jan 2020	-		0.968	Continuing	Continuing	0.000
		Subtotal	0.124	1.448		1.799		2.658		-		2.658	Continuing	Continuing	N/A

Remarks

$720K realigned out of FY18 TOA 10.22.18

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.500	9.888		6.117		8.735		-		8.735	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

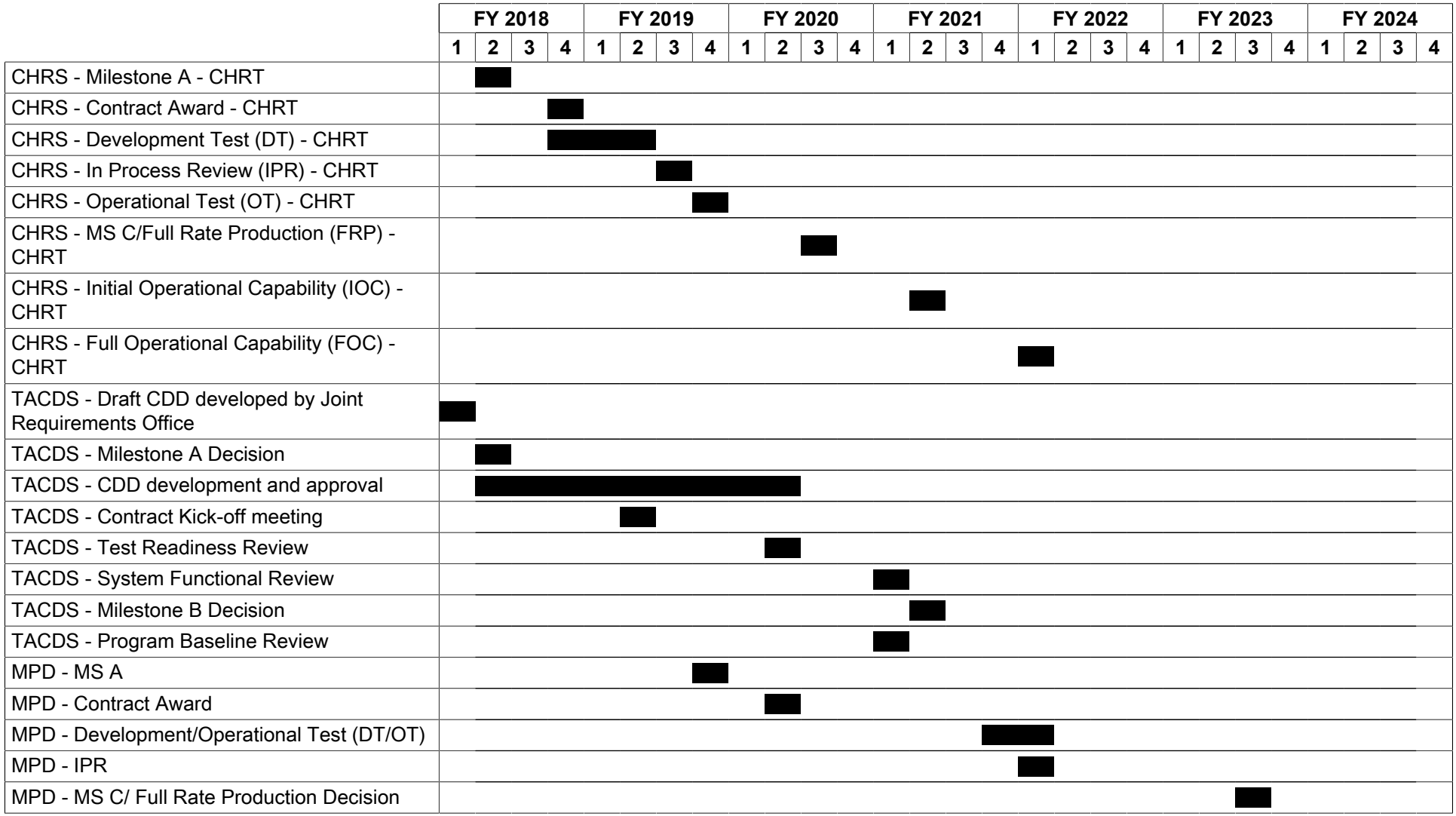

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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 - Initial Operational Capability																											■	

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** DE4 / *DECONTAMINATION SYSTEMS (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CHRS - Milestone A - CHRT	2	2018	2	2018
CHRS - Contract Award - CHRT	4	2018	4	2018
CHRS - Development Test (DT) - CHRT	4	2018	2	2019
CHRS - In Process Review (IPR) - CHRT	3	2019	3	2019
CHRS - Operational Test (OT) - CHRT	4	2019	4	2019
CHRS - MS C/Full Rate Production (FRP) - CHRT	3	2020	3	2020
CHRS - Initial Operational Capability (IOC) - CHRT	2	2021	2	2021
CHRS - Full Operational Capability (FOC) - CHRT	1	2022	1	2022
TACDS - Draft CDD developed by Joint Requirements Office	1	2018	1	2018
TACDS - Milestone A Decision	2	2018	2	2018
TACDS - CDD development and approval	2	2018	2	2020
TACDS - Contract Kick-off meeting	2	2019	2	2019
TACDS - Test Readiness Review	2	2020	2	2020
TACDS - System Functional Review	1	2021	1	2021
TACDS - Milestone B Decision	2	2021	2	2021
TACDS - Program Baseline Review	1	2021	1	2021
MPD - MS A	4	2019	4	2019
MPD - Contract Award	2	2020	2	2020
MPD - Development/Operational Test (DT/OT)	4	2021	1	2022
MPD - IPR	1	2022	1	2022
MPD - MS C/ Full Rate Production Decision	3	2023	3	2023
MPD - Initial Operational Capability	3	2024	3	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) IP4 / *INDIVIDUAL PROTECTION (ACD&P)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
IP4: *INDIVIDUAL PROTECTION (ACD&P)*	-	4.421	3.228	1.997	-	1.997	1.997	2.994	0.000	0.000	0.000	14.637
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) which enable the Joint Force to survive and continue the mission in chemical, biological, and radiological (CBR) contaminated environments.

Efforts included in this project are:
(1) the Uniform Integrated Protection Ensemble (UIPE) Increment 2
(2) the Uniform Integrated Protection Ensemble Family of Systems (UIPE FoS)

In FY19, CBRN UIPE Increment 2 (UIPE 2) will transition to CBRN UIPE FoS. This is reflected not only in the name change but in the structure of the program. The program is designed to meet mission area needs, not individual Service needs. There are four Mission Areas: Land, Air, Sea, and Homeland Defense. Each of the Mission Areas has unique mission requirements that the UIPE FoS solutions will seek to fulfill. (2) the Tactical All-Hazards Threat Protective Ensemble (TATPE) will be a subset to the UIPE FoS and capitalize on the protection factor of commercial Level A with design modifications to align with the necessary operational imperatives to eliminate this risk paradox. 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.

UIPE FoS will develop a family of systems that will provide the broad spectrum of users individual percutaneous protective equipment with the ability to operate in a contaminated environment with no or minimal degradation in performance. UIPE FoS will provide protection from operationally relevant traditional, non-traditional, and advanced chemical, biological, radiological, and nuclear/Toxic Industrial Material threats likely to be encountered during joint force operations. TATPE will provide high risk personnel (CBRN and Explosive Ordinance Disposal) increased protection against non-traditional and advanced threat agents during CWMD missions. These missions are representative of chemical production or bulk storage facility defeat, chemical weapon facility defeat, and interdiction or recovery of chemical weapons/ devices while in transit.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) UIPE - Increment 2 ***Description:*** Concept Design Evaluation/Technology Maturation and Risk Reduction	2.682	-	-
Title: 2) UIPE - Increment 2 ***Description:*** Develop Tactical All-Hazards Threat Protective Ensemble (TATPE)	1.739	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 3) UIPE FoS	-	3.228	1.997
Description: Concept Design Evaluation/Technology Maturation and Risk Reduction ***FY 2019 Plans:*** Land Mission Area: Award Other Transaction Authority (OTA) contracts for prototypes; conduct material level testing on OTA and government prototypes; complete material level testing on non-developmental items; continue early user testing; continue system level testing on all prototypes and non-developmental item candidates, continue design phase activities (Design Verification Testing (DVT), detailed design, etc.) for all prototypes. Update the Business Case Analysis (BCA). ***FY 2020 Plans:*** Land Mission Area: 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). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.			
Accomplishments/Planned Programs Subtotals	4.421	3.228	1.997

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• IP5: *INDIVIDUAL PROTECTION (EMD)*	13.529	9.324	12.663	-	12.663	13.013	11.162	11.343	11.342	Continuing	Continuing
• JI0002: *JS AIRCREW MASK (JSAM)*	25.086	54.775	69.416	-	69.416	72.863	67.612	50.622	8.280	Continuing	Continuing
• JI0003: *JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)*	53.154	16.927	13.209	-	13.209	12.499	25.193	3.891	0.000	0.000	124.873
• MA0401: *CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)*	10.508	13.064	9.984	-	9.984	13.415	3.553	0.000	0.000	0.000	50.524

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

D. Acquisition Strategy

CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)

Reference UIPE FOS acquisition strategy.

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

The UIPE FoS will develop a family of systems that will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional CBRN threats. The family of systems will be developed based on Service mission profiles (Land, Sea, Air and Homeland Defense) with the goal being to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems. An Other Transaction Authority (OTA) contracting approach will be used 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. Procurement will be through either the OTA or a more traditional contracting vehicle. UIPE FoS and the Services identified a mature solution that may meet Air Mission Area suit requirements. The program will identify data gaps from the United States Air Force's (USAF) test and evaluation of the Chemical, Biological, Radiological Layer (CBRL) of the Integrated Aircrew Ensemble. There is high confidence in the CBRL meeting the requirements for the Services.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UIPE - HW SB - TATPE Design Development/ Configuration	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.100	0.243	Oct 2017	0.000		0.000		-		0.000	0.000	0.343	0.000
UIPE FOS - HW S - Prototype Development	Various	TBD : TBD	0.000	0.000		1.000	Dec 2018	0.400	Nov 2019	-		0.400	0.000	1.400	0.000
		Subtotal	0.100	0.243		1.000		0.400		-		0.400	0.000	1.743	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UIPE - TD/D S - Integrated Product Team (IPT), Program, Engineering, and Technical Support	MIPR	Various : Various	4.212	0.175	Oct 2017	0.000		0.000		-		0.000	0.000	4.387	0.000
UIPE - TD/D S - Tactical Advanced Threat Protective Ensemble (TATPE) Concept Design/ Engineering	MIPR	US Army Natick Soldier RD&E Center : Natick, MA	1.414	0.387	Oct 2017	0.000		0.000		-		0.000	0.000	1.801	0.000
UIPE - TD/D S - TATPE Engineering Analysis	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.506	1.109	Oct 2017	0.000		0.000		-		0.000	0.000	1.615	0.000
UIPE FOS - UIPE - TD/D S - Integrated	MIPR	Various : Various	0.000	0.000		0.546	Dec 2018	0.050	Nov 2019	-		0.050	0.000	0.596	0.000
UIPE FOS - UIPE - ES S - Systems	MIPR	Various : Various	0.000	0.000		0.546	Dec 2018	0.279	Nov 2019	-		0.279	0.000	0.825	0.000
		Subtotal	6.132	1.671		1.092		0.329		-		0.329	0.000	9.224	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) IP4 / *INDIVIDUAL PROTECTION (ACD&P)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UIPE - DTE S - Design Concept/System Level Testing	MIPR	Various : Various	2.944	1.954	Jul 2018	0.000		0.000		-		0.000	0.000	4.898	0.000
UIPE FOS - UIPE - DTE S - Design	MIPR	Various : Various	0.000	0.000		0.445	Dec 2018	0.841	Nov 2019	-		0.841	0.000	1.286	0.000
		Subtotal	2.944	1.954		0.445		0.841		-		0.841	0.000	6.184	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UIPE - PM/MS S - Program Management Support	MIPR	Various : Various	1.495	0.553	Jan 2018	0.000		0.000		-		0.000	0.000	2.048	0.000
UIPE FOS - UIPE - PM/MS C	MIPR	Various : Various	0.000	0.000		0.691	Dec 2018	0.427	Nov 2019	-		0.427	0.000	1.118	0.000
		Subtotal	1.495	0.553		0.691		0.427		-		0.427	0.000	3.166	N/A

Remarks

$250K realigned out of FY18 TOA 10.22.18

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.671	4.421		3.228		1.997		-		1.997	0.000	20.317	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

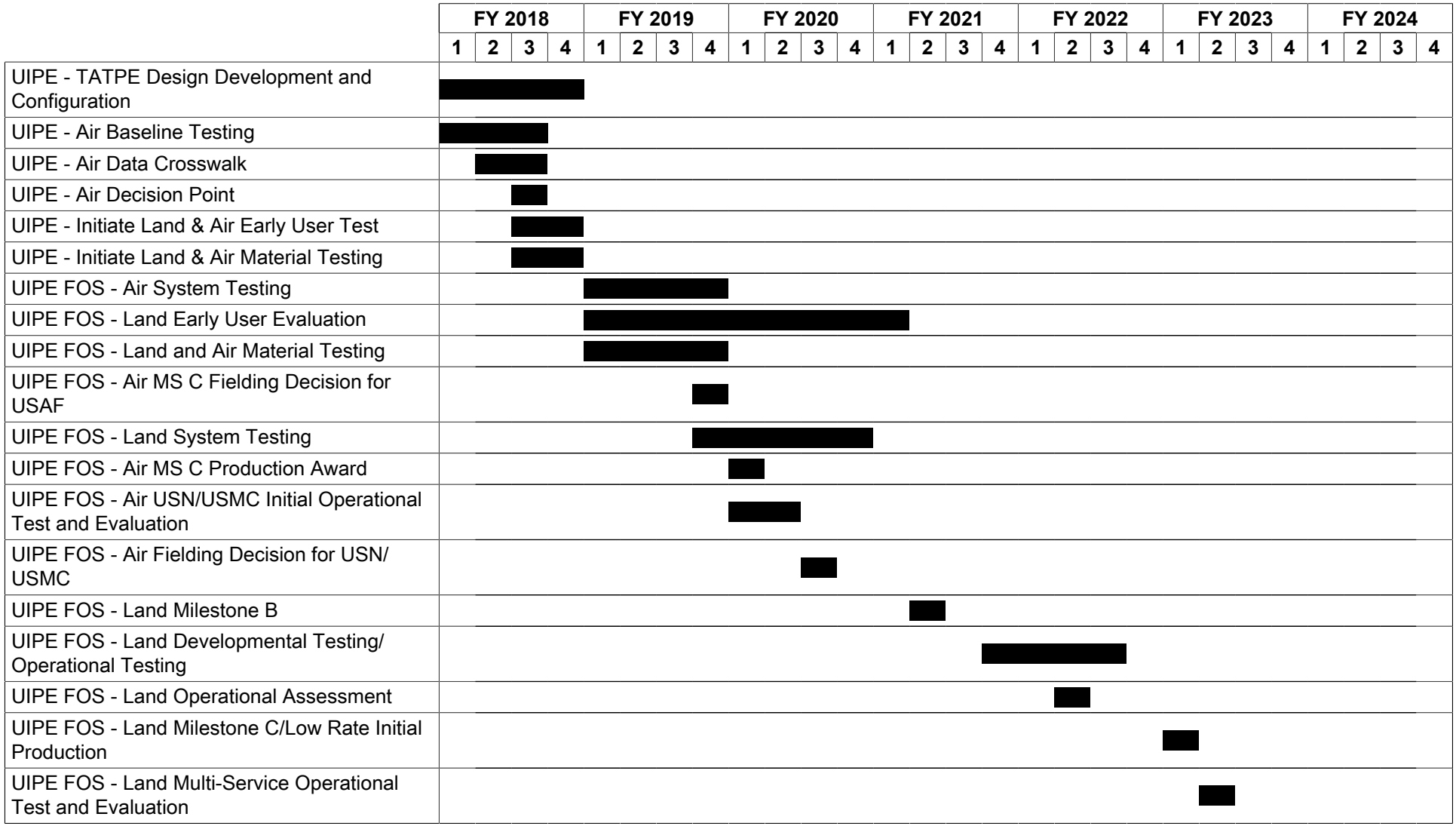

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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 - Land Full Rate Production																								■				

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IP4 / *INDIVIDUAL PROTECTION (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UIPE - TATPE Design Development and Configuration	1	2018	4	2018
UIPE - Air Baseline Testing	1	2018	3	2018
UIPE - Air Data Crosswalk	2	2018	3	2018
UIPE - Air Decision Point	3	2018	3	2018
UIPE - Initiate Land & Air Early User Test	3	2018	4	2018
UIPE - Initiate Land & Air Material Testing	3	2018	4	2018
UIPE FOS - Air System Testing	1	2019	4	2019
UIPE FOS - Land Early User Evaluation	1	2019	1	2021
UIPE FOS - Land and Air Material Testing	1	2019	4	2019
UIPE FOS - Air MS C Fielding Decision for USAF	4	2019	4	2019
UIPE FOS - Land System Testing	4	2019	4	2020
UIPE FOS - Air MS C Production Award	1	2020	1	2020
UIPE FOS - Air USN/USMC Initial Operational Test and Evaluation	1	2020	2	2020
UIPE FOS - Air Fielding Decision for USN/USMC	3	2020	3	2020
UIPE FOS - Land Milestone B	2	2021	2	2021
UIPE FOS - Land Developmental Testing/Operational Testing	4	2021	3	2022
UIPE FOS - Land Operational Assessment	2	2022	2	2022
UIPE FOS - Land Milestone C/Low Rate Initial Production	1	2023	1	2023
UIPE FOS - Land Multi-Service Operational Test and Evaluation	2	2023	2	2023
UIPE FOS - Land Full Rate Production	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*				Project (Number/Name) IS4 / *INFORMATION SYSTEMS (ACD&P)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
IS4: *INFORMATION SYSTEMS (ACD&P)*	-	5.336	0.854	0.528	-	0.528	0.174	0.070	0.067	0.067	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project includes efforts responsible for providing the information architecture and applications for shaping the battlespace against the Chemical, Biological, Radiological and Nuclear (CBRN) threat. During this phase, efforts will continue prototyping and technology development and transition efforts for new technologies and capabilities to fulfill requirements.

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

G-BSP will complete remaining efforts for prototyping, developing, and evaluating new technologies, models, and tools from both internal and external developers for transition into G-BSP, as needed.
This will be integrated into a web-based enterprise environment that facilitates collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological hazards. This will result in a set of tools and capabilities that facilitate the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

JEM 2 will continue to adapt and merge emerging science and technology (S&T) capability into a unified architecture and common software baseline that expedites transition of mature S&T into the JEM 2 baseline. This will be integrated into a web-based software application that supplies the Department of Defense (DoD) with the only operationally tested and accredited tool to effectively model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. This will provide warfighters with the ability to accurately model and predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM) events and effects. Additionally, this will support planning efforts to mitigate the effects of Weapons of Mass Destruction (WMD) and to provide rapid estimates of hazards and effects integrated into the Common Operational Picture (COP).

JWARN 2 will continue integration of emerging science and technology capabilities received from Advanced Technical Development (ATD) phase and complete JWARN Technology Demonstrations and User Assessments to evaluate and prove component and subsystem maturity of critical science and technology, system performance, and validate requirements within the IT BOX construct and Agile Process developed software prototype(s). This will be integrated into an accredited DoD warning and reporting system that enables an immediate and integrated response to threats of contamination by WMD, CBRN and TIM incidents. This will provide a digital display of CBRN 1-6 reports on the COP, displayed through Service provided Command, Control, Communications, Computers, and Intelligence (C4I) C2 systems resident at all

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

echelons of command. Commanders will be provided with enhanced situational awareness throughout the area of operation, supports warfighter battle management and continuity of operations in a contaminated environment.

The SSA will continue required modifications to the integrated Architecture on host platforms and document the infrastructure and technical standards, developing an acquisition Cybersecurity/IA strategy and architecture products for the JWARN, JEM, Man portable radiological detection system, Radiological Detection System, Next generation Chemical detector and other JPEO CBD programs and initiatives. This will provide the Chem-Bio Defense user developmental support and service organization to facilitate net-centric interoperability of systems in acquisition for the Warfighter. This includes, but is not limited to, solutions for Cybersecurity/Information Assurance (IA), Integrated Architectures, Data Management/Modeling, Interoperability Certifications, Verification, Validation and Accreditation (VV&A) to support interoperable and integrated net-centric, service-oriented solutions for CBRN systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Global-BSP	0.340	0.201	0.021
Description: Program Management ***FY 2019 Plans:*** Continue management and oversight of technology development and transition efforts for new technologies and capabilities designed to satisfy Global-BSP requirements. ***FY 2020 Plans:*** Continue management and oversight of technology development and transition efforts for new technologies and capabilities designed to satisfy Global-BSP requirements. Coordinate Sustainment transition activities with Special Operations Command (SOCOM). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) Global-BSP	0.843	0.361	0.139
Description: Product Development ***FY 2019 Plans:*** Complete remaining efforts for prototyping, developing, and evaluating new technologies, models, and tools from both internal and external developers for transition into Global-BSP as needed. ***FY 2020 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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 SIPR requirement for Global-BSP. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) Global-BSP ***Description:*** Training and Logistics Support ***FY 2020 Plans:*** Perform Training Development, Integrated Logistic Support, and Configuration Management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	-	0.048
Title: 4) JEM 2 ***Description:*** Prototyping and Development ***FY 2019 Plans:*** Continue integration of emerging science and technology capabilities received from Advanced Technical Development (ATD) phase and defined in Requirements Definition Package (RDP) 3 and 4. ***FY 2020 Plans:*** 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&T capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.104	0.075	0.210
Title: 5) JEM 2 ***Description:*** Management Support ***FY 2020 Plans:*** Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	0.029

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to change in program/project schedule.			
Title: 6) JWARN 2 ***Description:*** Prototyping ***FY 2019 Plans:*** Transition capabilities from advanced component development and prototype effort to system development. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	0.739	0.022	-
Title: 7) JWARN 2 ***Description:*** Product Development ***FY 2019 Plans:*** Complete JWARN Technology Demonstrations and User Assessments to evaluate and prove component and subsystem maturity of critical science and technology, system performance, and validate requirements within the IT BOX construct and Agile Process developed software prototype(s). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	1.186	0.037	-
Title: 8) JWARN 2 ***Description:*** Test and Evaluation (T&E) ***FY 2019 Plans:*** Complete Government developmental testing and analysis of component and subsystem maturity, to include Technology Readiness Assessment(s), of software submitted for evaluation during prototyping. Complete the DOD Information Assurance Certification and Accreditation and Joint Interoperability Certification process. Complete Operational Test (OT) of the JWARN systems (CD 2.1, 2.2, 2.4, & 2.5) capabilities to CBRN IS and Army, Marine, and Navy. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	0.687	0.020	-
Title: 9) JWARN 2 ***Description:*** Program Management Support	0.515	0.017	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Complete the strategic, tactical planning, program/financial management, costing, contracting, scheduling, acquisition oversight, and milestone documentation for the program within IT BOX construct and Agile Software development process. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.			
Title: 10) JWARN 2 ***Description:*** Technical Support ***FY 2019 Plans:*** Complete the engineering and technical support for JWARN development under the IT BOX construct and Agile Software development processes. Complete the independent system verification, validation, and class type accreditation as required. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	0.826	0.027	-
Title: 11) SSA ***Description:*** Integrated Architecture ***FY 2019 Plans:*** Continue the development of integrated architectures for Joint CBRN programs across the JPEO CBRND enterprise. Develop architecture products for the Joint Warning and Reporting Network, Joint Effects Model, Man portable radiological detection system, Radiological Detection System, Next generation Chemical detector. Continue required modifications to the integrated Architecture on host platforms and document the infrastructure and technical standards, developing an acquisition Cybersecurity/ IA strategy. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.096	0.094	0.081
Accomplishments/Planned Programs Subtotals	5.336	0.854	0.528

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• IS5: *INFORMATION SYSTEMS (EMD)*	21.789	22.215	22.111	-	22.111	17.935	13.781	7.695	7.694	Continuing	Continuing
• IS7: *INFORMATION SYSTEMS (OP SYS DEV)*	11.923	15.051	16.811	-	16.811	16.133	14.916	12.993	12.993	Continuing	Continuing
• G47101: *JOINT WARNING & REPORTING NETWORK (JWARN)*	0.933	0.502	0.442	-	0.442	0.394	0.370	0.375	0.375	Continuing	Continuing
• JC0208: *JOINT EFFECTS MODEL (JEM)*	0.880	0.911	0.689	-	0.689	0.720	0.735	0.749	0.749	Continuing	Continuing
• JS5230: *SOFTWARE SUPPORT ACTIVITY (SSA)*	0.092	0.094	0.081	-	0.081	0.074	0.070	0.067	0.067	Continuing	Continuing
• JX0301: *BIOSURVELLENCE PORTAL (BSP)*	1.107	1.148	1.124	-	1.124	1.003	0.705	0.000	0.000	0.000	5.087

Remarks

D. Acquisition Strategy

BIOSURVEILLANCE PORTAL (BSP)

The Global-Biosurveillance Portal (Global-BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The Global-BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20. The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

JOINT EFFECTS MODEL (JEM)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

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

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

As part of this strategy a single JEM 2 integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in March 2017.

The current contractor for JEM 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1, CD 2.2, and CD 2.3 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The contract awarded in March 2017 includes scope for developing the remaining capabilities under the JEM 2 contract. The contract utilizes full and open competition and is referred to as the JEM 1 and 2 development, modernization and sustainment contract.

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

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

JOINT WARNING & REPORTING NETWORK (JWARN)

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

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

portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

The JWARN 2 Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

The current contractor for JWARN 2, Northrup Grumman, will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1) and RDP-2 documents.

As part of the strategy for a single JWARN 2 integrator, a follow-on contract was awarded in December 2018. The follow-on contractor, DCS Corp, for JWARN 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The follow-on contract in FY18 will include scope for developing the remaining capabilities under the JWARN contract. The JWARN 2 follow-on contract will utilize full and open competition and will be referred to as the JWARN 2 software development and maintenance contract.

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

SOFTWARE SUPPORT ACTIVITY (SSA)

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

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - SW S - Software Development	FFRDC	Johns Hopkins University - Applied Physics Lab : Laurel, MD	1.398	0.843	Dec 2017	0.361	Dec 2018	0.185	Dec 2019	-		0.185	Continuing	Continuing	0.000
JEM - 2 - SW SB - Prototype development	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	6.735	0.104	Apr 2018	0.075	Apr 2019	0.239	Apr 2020	-		0.239	Continuing	Continuing	0.000
JWARN - 2- SW S - Prototype Dev Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.000	0.001		0.059	Dec 2019	0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- SW S - Prototype Development	C/CPFF	Northrop Grumman Corp. : Winter Park, FL	10.112	1.924	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	18.245	2.872		0.495		0.424		-		0.424	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JWARN - 2 ES S - Engineering Support	MIPR	Various : Various	8.149	0.826	Dec 2017	0.027	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
SSA - TD/D C - Engineering Support	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	0.390	0.096	Dec 2017	0.094	Dec 2018	0.081	Dec 2019	-		0.081	Continuing	Continuing	0.000
		Subtotal	8.539	0.922		0.121		0.081		-		0.081	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) IS4 / *INFORMATION SYSTEMS (ACD&P)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JWARN - 2 - OTHT SB - Gov't developmental testing	MIPR	Various : Various	3.096	0.687	Dec 2017	0.020	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	3.096	0.687		0.020		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - PM/MS S - Program Management Support	Various	Various : Various	0.762	0.340	Dec 2017	0.201	Dec 2018	0.023	Dec 2019	-		0.023	Continuing	Continuing	0.000
JWARN - 2 - PM/MS SB - Program management	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	4.795	0.515	Dec 2017	0.017	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	5.557	0.855		0.218		0.023		-		0.023	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.437	5.336		0.854		0.528		-		0.528	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

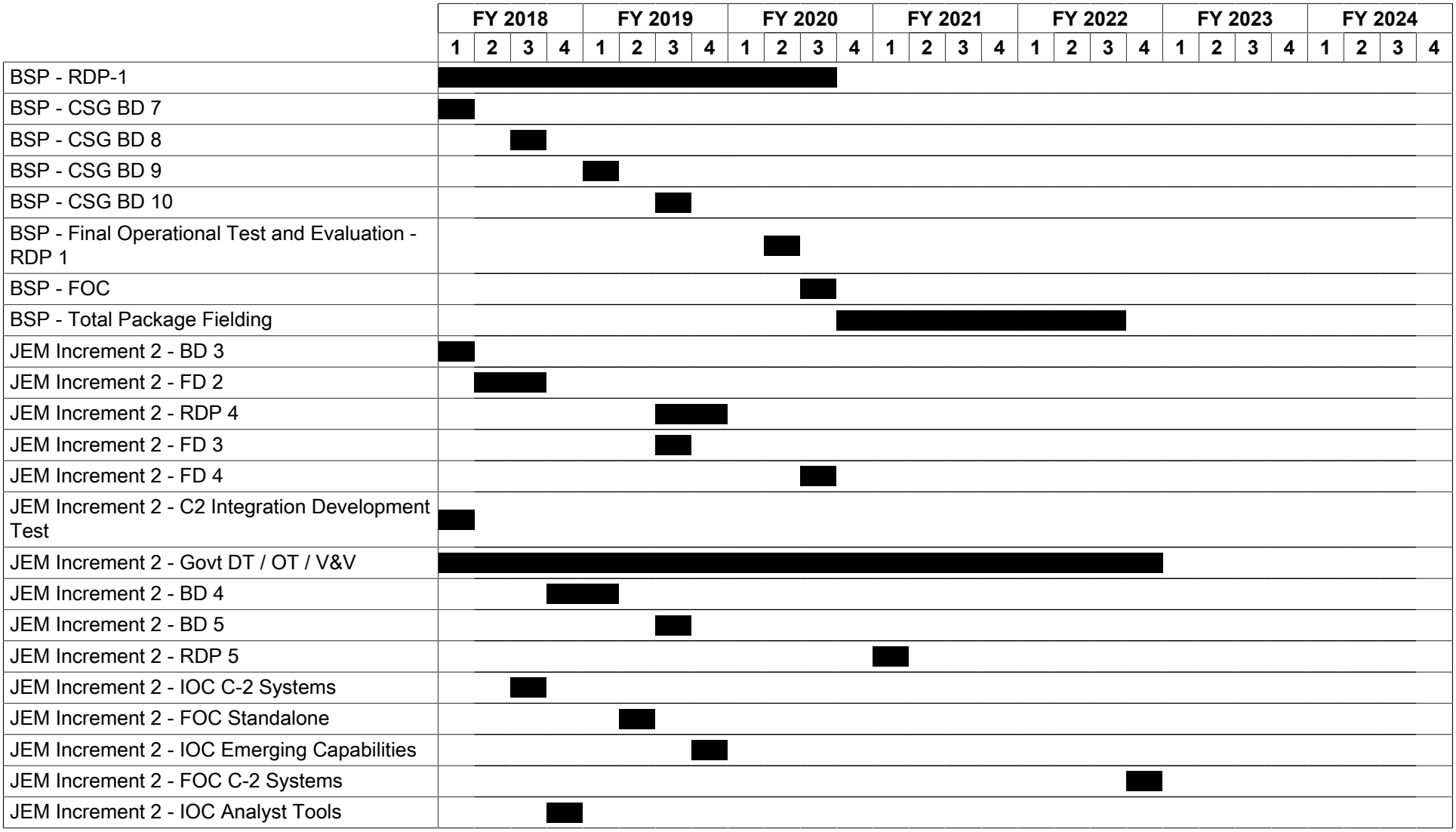

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

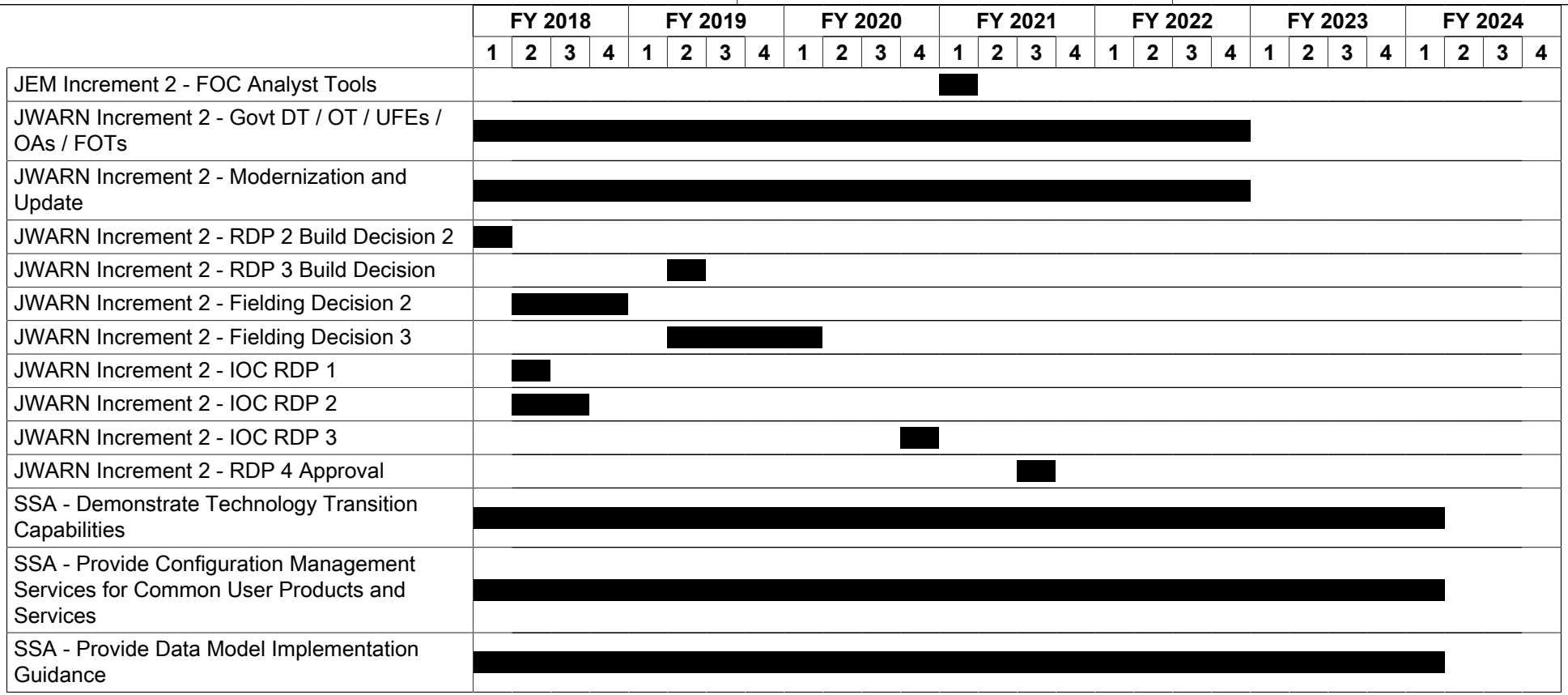

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BSP - RDP-1	1	2018	3	2020
BSP - CSG BD 7	1	2018	1	2018
BSP - CSG BD 8	3	2018	3	2018
BSP - CSG BD 9	1	2019	1	2019
BSP - CSG BD 10	3	2019	3	2019
BSP - Final Operational Test and Evaluation - RDP 1	2	2020	2	2020
BSP - FOC	3	2020	3	2020
BSP - Total Package Fielding	4	2020	3	2022
JEM Increment 2 - BD 3	1	2018	1	2018
JEM Increment 2 - FD 2	2	2018	3	2018
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 - C2 Integration Development Test	1	2018	1	2018
JEM Increment 2 - Govt DT / OT / V&V	1	2018	4	2022
JEM Increment 2 - BD 4	4	2018	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - RDP 5	1	2021	1	2021
JEM Increment 2 - IOC C-2 Systems	3	2018	3	2018
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JEM Increment 2 - FOC C-2 Systems	4	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** IS4 / *INFORMATION SYSTEMS (ACD&P)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JEM Increment 2 - IOC Analyst Tools	4	2018	4	2018
JEM Increment 2 - FOC Analyst Tools	1	2021	1	2021
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2018	4	2022
JWARN Increment 2 - Modernization and Update	1	2018	4	2022
JWARN Increment 2 - RDP 2 Build Decision 2	1	2018	1	2018
JWARN Increment 2 - RDP 3 Build Decision	2	2019	2	2019
JWARN Increment 2 - Fielding Decision 2	2	2018	4	2018
JWARN Increment 2 - Fielding Decision 3	2	2019	1	2020
JWARN Increment 2 - IOC RDP 1	2	2018	2	2018
JWARN Increment 2 - IOC RDP 2	2	2018	3	2018
JWARN Increment 2 - IOC RDP 3	4	2020	4	2020
JWARN Increment 2 - RDP 4 Approval	3	2021	3	2021
SSA - Demonstrate Technology Transition Capabilities	1	2018	1	2024
SSA - Provide Configuration Management Services for Common User Products and Services	1	2018	1	2024
SSA - Provide Data Model Implementation Guidance	1	2018	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*				Project (Number/Name) MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
MB4: *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*	-	71.070	65.209	48.166	-	48.166	75.343	70.991	78.526	73.550	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) Medical Countermeasure Platform Technologies (MCMPT)
(2) Advanced Development and Manufacturing (ADM) facility
(3) Biosafety Level 4 Good Laboratory Practice Test and Evaluation (BSL4 GLP T&E)
(4) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B)
(5) Next Generation Diagnostic System (NGDS)
(6) Antiviral Therapeutic (AV TX)
(7) Filovirus Vaccine (VAC FILO)
(8) Ricin vaccine (VAC RIC)
(9) Venezuelan Equine Encephalitis (VAC VEE)
(10) Western, Eastern, and Venezuelan Equine Encephalitis (VAC WEVEE) Vaccine

The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the medical countermeasure (MCM) development risks. Efforts will center on leveraging the DoD's Advanced Development Manufacturing (ADM) 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. The first platform being established as part of a thirty-six month Advanced Technology Demonstration (ATD) is the Advanced Development and Manufacturing Antibody Technologies (ADAMANT). This platform provides an enduring capability from which future candidates can be manufactured. A second platform technology will be established which will focus on a vaccine platform capability. The Agile Medical Paradigm (AMP) is the CBDP's strategic framework to accelerate the delivery of MCMs. To achieve this goal the DOD is establishing a medical countermeasures platform (MCMPT) capability.

The 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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

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. In FY20 the Department is providing dedicated funds to support operational availability.

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 approval of leading biodefense medical countermeasure candidates to protect the Warfighter and the Nation. This capability provides dedicated capacity for DoD to conduct biosafety level-4 (BSL-4) GLP T&E studies to meet programmatic needs following all applicable regulatory, biosurety, and safety standards.

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 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 (CAPB) that was required as part of the acquisition strategy for the antibiotic repurposing program from S&T to advanced development.

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 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.

The AV TX Program is continuing the development of a Ebola Zaire therapeutic treatment drug that is on the regulatory path for FDA approval as an antiviral therapeutic for the warfighter. AV TX is continuing the development of models to test for alphavirus therapeutics that include several Natural History Studies required per FDA and animal rule regulatory requirements. Other pathogens on the biological warfare threat list, including viruses of interest from Filoviridae, Arenaviridae, Bunyaviridae, and Flaviviridae, are targets of future development efforts. 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 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 to further develop Ebola vaccine candidates to meet the DoD requirement. The current budget supports development of a single Marburg prototype to protect against the BW threat through TMRR phase. 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).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

The VAC RIC program supports one DoD vaccine candidate including manufacturing GMP lots; and the continuation of animal model and assay development studies. The Ricin toxin is a validated bioweapon threat that is lethal, available and easily produced. The VAC RIC Program concluded development activities and transferred the technology to the ADMc in FY18.

The VAC WEVEE Vaccine will protect the Warfighter against aerosolized exposure to three strains of alphaviruses; Western, Eastern and Venezuelan equine encephalitis viruses. Services have prioritized the development and delivery of an FDA-licensed Venezuelan Equine Encephalitis Virus (VEEV) vaccine. In FY19 the VAC WEVEE program shifted to the VAC VEE program. The VAC VEE program 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. Several potential decision points will be used to assess the prototypes at competitive selection. The schedule is based on a competitive selection to one prototype. The Government will serve as the integrator during this phase by managing and coordinating the various vaccine development efforts. At MS B, the best prototype will be selected through a full and open competition to transition to the Engineering and Manufacturing Development (EMD) phase, with delivery of a FDA-licensed WEVEE vaccine. The development efforts will be a Cost Plus and Firm Fixed Price CLINs. Additionally, the Program Office will partner with Health and Human Services/National Institute of Allergies and Infectious Diseases (HHS/NIAID), DoD agencies, and laboratories to include U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID). 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 2018	FY 2019	FY 2020
Title: 1) MCMPT	0.500	8.802	7.704
Description: Rapid Response ***FY 2019 Plans:*** Continue development of a rapid response capability. ***FY 2020 Plans:*** Continue development of a rapid response capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) MCMPT	-	16.331	7.189
Description: ADAMANT ***FY 2019 Plans:*** Initiate optimization of ADAMANT to support delivery of a product MCM. ***FY 2020 Plans:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue optimization of ADAMANT to support delivery of a product MCM. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) MCMPT ***Description:*** Vaccine Platform ***FY 2019 Plans:*** Initiate development efforts for the vaccine platform capability. ***FY 2020 Plans:*** Continue development efforts for the vaccine platform capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	3.445	1.397
Title: 4) DoD ADM Capability Building ***Description:*** Establish proven enabling manufacturing technologies at the DoD ADM. ***FY 2020 Plans:*** Initiate tech transfer and enhancement of manufacturing technologies to support MCM development against biological threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.	-	-	8.000
Title: 5) BSL-4 GLP T&E ***Description:*** Clinical Studies ***FY 2019 Plans:*** Continue to conduct two GLP BSL-4 T&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&E capability. ***FY 2020 Plans:***	7.027	6.696	5.734

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue to conduct two GLP BSL-4 T&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&E capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 6) CMDR-B ***Description:*** Preclinical	10.230	-	-
Title: 7) CMDR-B ***Description:*** Anti-Bacterial Therapeutics ***FY 2019 Plans:*** Execute programmatic and engineering support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Advanced Development.	-	2.035	-
Title: 8) NGDS 2 ***Description:*** Chemical Diagnostic System ***FY 2019 Plans:*** Continue to develop and mature prototype for Chemical agent diagnostics. ***FY 2020 Plans:*** Complete development of prototype for Chemical agent diagnostics. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	4.472	8.653	0.619
Title: 9) AV TX ***Description:*** Filo Candidate / Enabling Technology	18.748	-	-
Title: 10) VAC FILO ***Description:*** Assays, nonclinical and clinical	7.330	6.667	6.303

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue testing , continue nonclinical studies to evaluate vaccine prototype, and continue support of clinical trials. ***FY 2020 Plans:*** Continue nonclinical studies for vaccine prototype, and continue support of clinical trial. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 11) VAC FILO ***Description:*** Manufacturing ***FY 2019 Plans:*** Continue stability testing and manufacturing efforts. ***FY 2020 Plans:*** Continue stability testing and manufacturing efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.	5.619	5.751	6.500
Title: 12) VAC RIC ***Description:*** Development Activities	0.483	-	-
Title: 13) VAC VEE ***Description:*** Non Clinical, Clinical, and Manufacturing ***FY 2019 Plans:*** Continue clinical, nonclinical and manufacturing efforts for multiple candidates prior to competitive selection. ***FY 2020 Plans:*** Continue clinical, nonclinical and manufacturing efforts for multiple candidates prior to competitive selection. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.	-	6.829	4.720
Title: 14) VAC WEVEE	16.661	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Nonclinical, Clinical, and Manufacturing			
Accomplishments/Planned Programs Subtotals	71.070	65.209	48.166

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MB5: *MEDICAL BIOLOGICAL DEFENSE (EMD)*	130.240	117.331	119.227	-	119.227	97.501	71.221	78.435	82.815	Continuing	Continuing
• MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	Continuing	Continuing
• JM6677: *ADVANCED ANTICONVULSANT SYSTEM (AAS)*	0.000	0.360	5.352	-	5.352	2.696	2.694	3.991	0.000	0.000	15.093
• JM8788: *NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)*	6.498	6.563	4.905	-	4.905	9.156	8.067	9.064	7.744	Continuing	Continuing
• JX0005: *DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)*	0.183	0.183	3.674	-	3.674	22.752	24.735	22.269	32.158	Continuing	Continuing
• JX0210: *DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)*	0.980	0.975	2.961	-	2.961	2.857	2.771	2.747	2.747	Continuing	Continuing
• JX0300: *BIOSURVEILLANCE (BSV)*	18.188	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.188

Remarks

D. Acquisition Strategy

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.

ADVANCED DEVELOPMENT & MANUFACTURING (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 option is scheduled for completion in 2QFY19, proceeded by a second, 2-year option.

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.

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 initial efficacy. 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. MS B for the program is planned for 4QFY20.

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

The NGDS Increment 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.

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The NGDS 2 program addresses CBR agents and COEs that the NGDS 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBR agent diagnostics across multiple echelons of care. 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 initiated prototyping of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. 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 anticipated to be cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings.

ANTI-VIRAL THERAPEUTICS (AV TX)

The Anti-viral Therapeutics program acquisition strategy supports the development of multiple therapeutics through the Technology Maturation and Risk Reduction (TMRR) phase against the Ebola (Zaire), Marburg, Sudan and alpha virus bio warfare threats. The initial therapeutic candidate is for the Ebola Zaire that is scheduled for a Milestone B decision review in FY19. The overall regulatory approach of the program remains to pursue development of products to FDA approval under the Animal Rule. The program will conduct pilot and pivotal animal efficacy, and toxicology studies for FDA approval. The acquisition strategy for each indication will have the performers submitting New Drug applications for the therapeutics during the Engineering, Manufacturing and Development (EMD) phases.

FILOVIRUS (VAC FILO)

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

RICIN VACCINE (VAC RIC)

The Ricin Vaccine Program acquisition strategy supported the development of a single vaccine through the Technology Maturation and Risk Reduction (TMRR) phase that will offer protection against the threat of aerosolized ricin toxin. The Government will serve as the integrator during the TMRR phase by managing and coordinating the various vaccine development efforts. The JPdM MCS-JVAP?s planned path for standing the program down involved completion of non-clinical studies and assay

work to bring these efforts to an equivalent TRL as the Ricin clinical studies. An Acquisition Decision Memorandum was signed by the MDA in May 2017, concurring with the stand down plan and also supported the establishment of GMP manufacturing at the ADMc facility.

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. Several potential decision points will be used to assess the prototypes at competitive selection. The schedule is based on a competitive selection to one prototype. The Government will serve as the integrator during this phase by managing and coordinating the various vaccine development efforts. At MS B, the best prototype will be selected through a full and open competition to transition to the EMD phase, with delivery of a FDA-licensed WEVEE vaccine. The development efforts will be a Cost Plus and Firm Fixed Price CLINs. Additionally, the Program Office will partner with Health and Human Services/National Institute of Allergies and Infectious Diseases (HHS/NIAID), DoD agencies, and laboratories to include USAMRIID. 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.

WESTERN EASTERN VENEZUELAN EQUINE ENCEPH VACCINE (VAC WEVEE)

The VAC WEVEE Vaccine program initiated competitive prototypes in FY13 to reduce program risk, and is developing multiple prototypes through the Technology Maturation and Risk Reduction Phase. The VAC WEVEE Vaccine will protect the Warfighter against aerosolized exposure to three strains of alphaviruses; Western, Eastern and Venezuelan equine encephalitis viruses. Services have prioritized the development and delivery of a licensed Venezuelan Equine Encephalitis (VEEV) vaccine. In FY19 the VAC WEVEE program shifted to the VAC VEE program

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCMPT - HW S - Rapid Response	C/CPFF	Ology : Alachua, FL	0.000	0.420	Jun 2018	5.308	Dec 2018	4.161	Dec 2019	-		4.161	Continuing	Continuing	0.000
MCMPT - HW S - ADAMANT MCM Development	C/CPFF	Ology : Alachua, FL	0.000	0.000		10.038	Dec 2018	7.430	Dec 2019	-		7.430	Continuing	Continuing	0.000
MCMPT - HW S - Vaccine Platform Development Efforts	C/CPFF	Ology : Alachua, FL	0.000	0.000		2.505	Dec 2018	1.002	Dec 2019	-		1.002	Continuing	Continuing	0.000
ADM - Enabling Manufacturing Technologies	C/CPFF	Ology : Alachua, FL	0.000	0.000		0.000		6.706	Dec 2019	-		6.706	Continuing	Continuing	0.000
CMDR-B - Pharmacokinetic studies of pathogens of interest and animal efficacy studies	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	1.736	0.226	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - Bacterial Therapeutics Core Program Evaluation of BAXDELA in the Treatment of Inhalational Disease	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	1.375	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - NGDS 2 Develop and mature prototypes for Chemical Agent Diagnostics	C/CPFF	MRI Global : Palm Bay, FL	0.000	1.566	Mar 2018	1.678	Dec 2018	0.452	Dec 2019	-		0.452	Continuing	Continuing	0.000
NGDS - HW C - NGDS 2 Develop and mature prototypes for Chemical Agent Diagnostics #2	Various	TBD : TBD	0.000	0.000		0.775	Jan 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	0.000	0.038	Sep 2018	0.087	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000

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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AV TX - Gilead Filo Candidate - Pilot Aerosol Animal Efficacy Studies	C/FP	Gilead Sciences : San Francisco, CA	15.044	3.152	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - MCMPT	MIPR	Ology : Alachua, FL	0.000	3.078	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Enabling Technologies - Manufacturing Process Optimization and Scale Up	C/CPIF	University of Pittsburgh : Pittsburgh, PA	1.335	1.215	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Enabling Technologies - Non Human Primate Animal Model Enhancement	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	5.015	2.279	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - Non Clinical Studies	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	19.538	1.857	Dec 2017	1.820	Dec 2018	2.826	Dec 2019	-		2.826	Continuing	Continuing	0.000
VAC FILO - HW S - Manufacturing	C/CPIF	Various : Various	12.894	2.614	Dec 2017	0.751	Dec 2018	0.500	Dec 2019	-		0.500	Continuing	Continuing	0.000
VAC RIC - SW GFPR - Manufacturing Tech Transfer, animal model & assay development	Various	Various : Various	1.956	0.228	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC VEE - Prototypes Phase 1 Clinical Trials	C/CPIF	Various : Various	0.000	0.000		6.174	Dec 2018	1.624	Oct 2019	-		1.624	Continuing	Continuing	0.000
VAC VEE - Prototypes Non Clinical Comparability Studies	Allot	Various : Various	0.000	0.000		0.000		0.670	Oct 2019	-		0.670	Continuing	Continuing	0.000
VAC VEE - Manufacturing	Various	TBD : TBD	0.000	0.000		0.000		1.990	Dec 2019	-		1.990	Continuing	Continuing	0.000
		Subtotal	57.518	18.048		29.136		27.361		-		27.361	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - ES C - Studies and WIPT Support	MIPR	John Hopkins University : Laurel, MD	0.000	0.282	Mar 2018	0.168	Dec 2018	0.000		-		0.000	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	3.378	0.030	Dec 2017	0.030	Dec 2018	0.040	Dec 2019	-		0.040	Continuing	Continuing	0.000
		Subtotal	3.378	0.312		0.198		0.040		-		0.040	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSL4 GLP T&E - DTE SB - T&E Facility	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	23.193	7.027	Dec 2017	6.696	Dec 2018	4.863	Dec 2019	-		4.863	Continuing	Continuing	0.000
VAC FILO - OTHT SB - Testing, Evaluation, and Clinical Trials	MIPR	Walter Reed Institute of Research : Washington, DC	40.617	1.202	Dec 2017	1.260	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - OTE C - Assay Development, Testing and Evaluation	C/CPFF	Various : Various	12.649	3.610	Dec 2017	2.200	Dec 2018	1.014	Dec 2019	-		1.014	Continuing	Continuing	0.000
VAC FILO - OTHT SB - Clinical Trials	C/CPIF	Various : Various	1.650	0.000	Dec 2017	0.326	Dec 2018	3.482	Dec 2019	-		3.482	Continuing	Continuing	0.000
VAC RIC - OTHT C - Stability Testing	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	1.901	0.255	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - DTE C - Testing	Allot	ATI Solutions : Inc., Tysons Corner, VA	0.000	7.693	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VAC WEVEE - OTE C - Test and Evaluation Assay Development	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	14.072	0.451	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - OTE C - Test and Evaluation Assay Development #2	MIPR	Battelle Memorial Institute : Columbus, OH	16.287	1.594	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - OTE C - Clinical Trial (Prototype)	MIPR	Various : Various	3.070	1.663	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	113.439	23.495		10.482		9.359		-		9.359	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCMPT - PM/MS C Program Management	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		2.934	Dec 2018	2.056	Dec 2019	-		2.056	Continuing	Continuing	0.000
MCMPT - PM/MS C - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	0.000		4.169	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
MCMPT - PM/MS S - Management	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.080	Jun 2018	3.624	Dec 2018	1.641	Dec 2019	-		1.641	Continuing	Continuing	0.000
ADM - PM/MS C - Program Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.734	Dec 2019	-		0.734	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADM - PM/MS C - Program Management Support #2	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.560	Dec 2019	-		0.560	Continuing	Continuing	0.000
BSL4 GLP T&E - PM/MS C - Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.493	Dec 2019	-		0.493	Continuing	Continuing	0.000
BSL4 GLP T&E - PM/MS C - Management Support #2	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.378	Dec 2019	-		0.378	Continuing	Continuing	0.000
CMDR-B - PM/MS S - Program Management/ Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.215	0.760	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - ADMc Sustainment	C/CPFF	Ology : Alachua, FL	0.000	7.619	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.592	0.000		1.455	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS S - Program Manager Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.082	0.250	Jul 2018	0.030	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Contractor Systems Engineering/ Program Management Support	C/FP	Various : Various	0.323	0.000	Jan 2018	0.550	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - PM/MS SB - Product Management Systems Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.650	0.997	Dec 2017	1.941	Dec 2018	0.041	Dec 2019	-		0.041	Continuing	Continuing	0.000
NGDS - PM/MS S - Product Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.530	Dec 2017	1.639	Dec 2018	0.045	Dec 2019	-		0.045	Continuing	Continuing	0.000
NGDS - PM/MS S - Product Management Support #2	MIPR	Various : Various	1.000	1.059	Dec 2017	2.365	Dec 2018	0.081	Dec 2019	-		0.081	Continuing	Continuing	0.000
AV TX - AV TX - ADMc Sustainment	C/CPFF	Ology : Alachua, FL	0.000	5.868	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - S - Program Management/ Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	3.482	1.028	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.174	0.133	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - S - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.972	1.360	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - SB Management Support	C/FP	Various : Various	1.382	0.635	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC FILO - PM/MS - Joint Vaccine Acquisition Program Management	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	4.390	2.790	Dec 2017	3.526	Dec 2018	3.096	Dec 2019	-		3.096	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VAC FILO - PM/MS S - Program Management/ Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	8.423	0.846	Dec 2017	2.505	Dec 2018	1.845	Dec 2019	-		1.845	Continuing	Continuing	0.000
VAC VEE - VAC VEE - PM/MS S - Program Manager Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.142	Dec 2018	0.094	Dec 2019	-		0.094	Continuing	Continuing	0.000
VAC VEE - PM/MS S - Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.513	Dec 2018	0.342	Dec 2019	-		0.342	Continuing	Continuing	0.000
VAC WEVEE - PM/ MS C - Joint Vaccine Acquisition Program Program Management	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	1.765	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
VAC WEVEE - PM/MS C - Contractor Systems Engineering Program Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	3.955	3.495	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	28.640	29.215		25.393		11.406		-		11.406	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	202.975	71.070		65.209		48.166		-		48.166	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

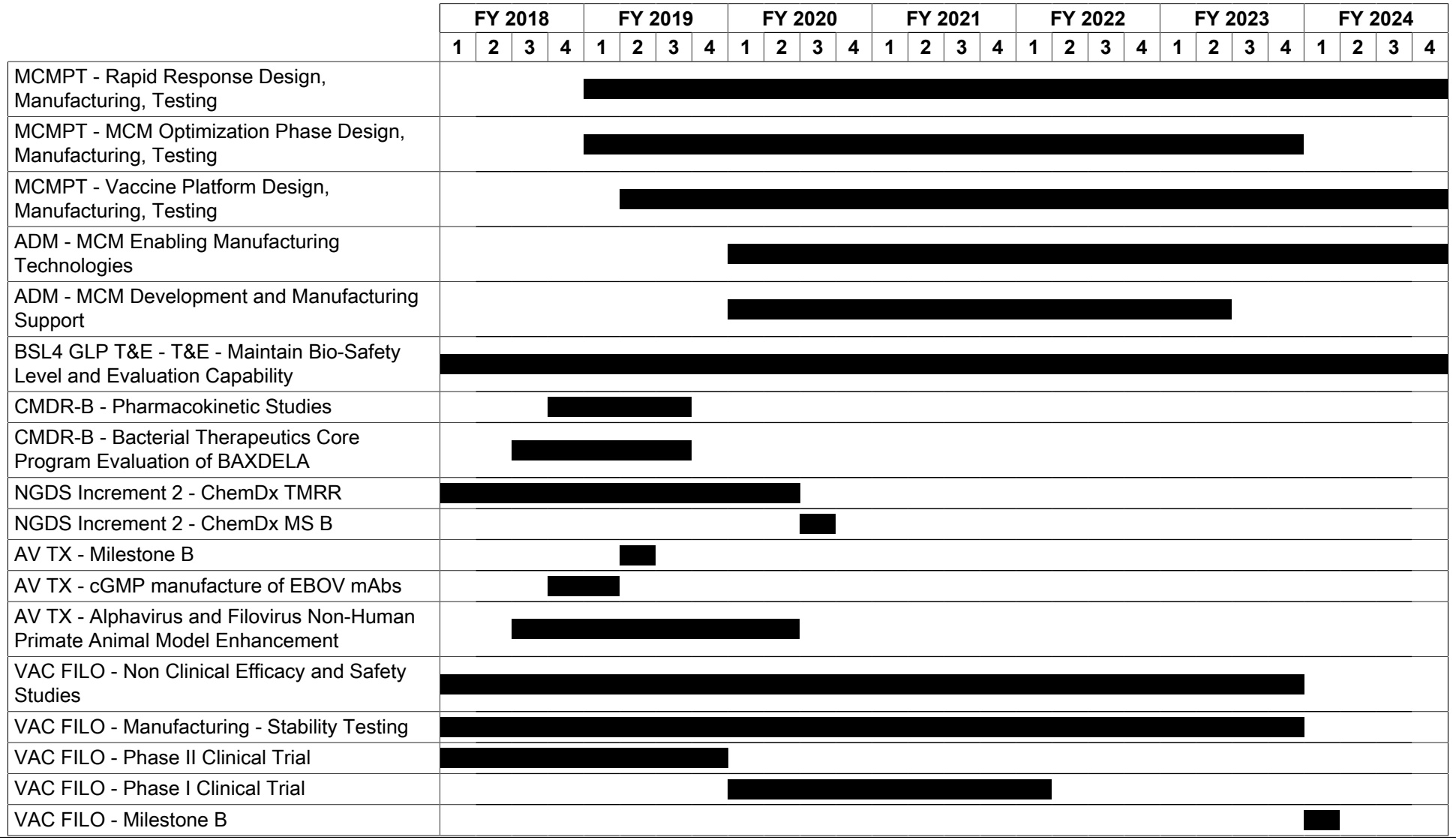

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

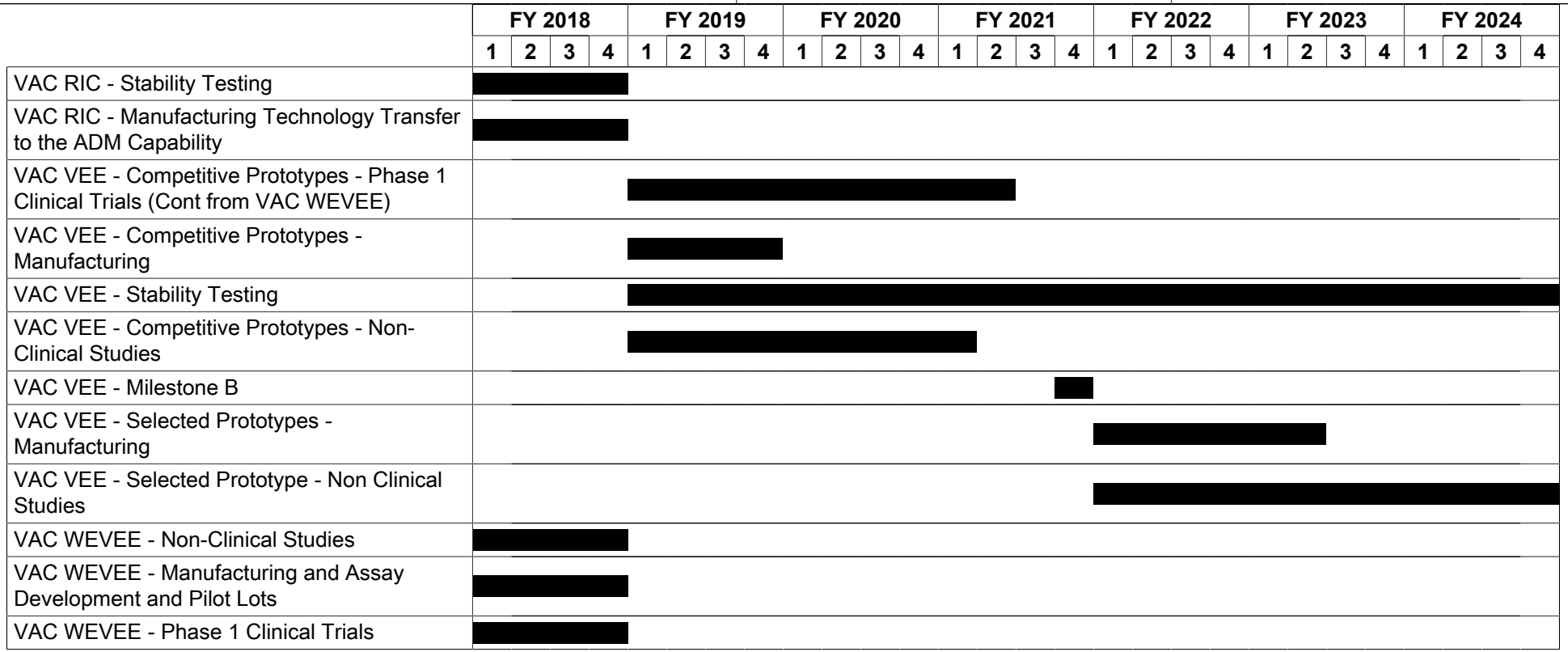

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MCMPT - Rapid Response Design, Manufacturing, Testing	1	2019	4	2024
MCMPT - MCM Optimization Phase Design, Manufacturing, Testing	1	2019	4	2023
MCMPT - Vaccine Platform Design, Manufacturing, Testing	2	2019	4	2024
ADM - MCM Enabling Manufacturing Technologies	1	2020	4	2024
ADM - MCM Development and Manufacturing Support	1	2020	2	2023
BSL4 GLP T&E - T&E - Maintain Bio-Safety Level and Evaluation Capability	1	2018	4	2024
CMDR-B - Pharmacokinetic Studies	4	2018	3	2019
CMDR-B - Bacterial Therapeutics Core Program Evaluation of BAXDELA	3	2018	3	2019
NGDS Increment 2 - ChemDx TMRR	1	2018	2	2020
NGDS Increment 2 - ChemDx MS B	3	2020	3	2020
AV TX - Milestone B	2	2019	2	2019
AV TX - cGMP manufacture of EBOV mAbs	4	2018	1	2019
AV TX - Alphavirus and Filovirus Non-Human Primate Animal Model Enhancement	3	2018	2	2020
VAC FILO - Non Clinical Efficacy and Safety Studies	1	2018	4	2023
VAC FILO - Manufacturing - Stability Testing	1	2018	4	2023
VAC FILO - Phase II Clinical Trial	1	2018	4	2019
VAC FILO - Phase I Clinical Trial	1	2020	1	2022
VAC FILO - Milestone B	1	2024	1	2024
VAC RIC - Stability Testing	1	2018	4	2018
VAC RIC - Manufacturing Technology Transfer to the ADM Capability	1	2018	4	2018
VAC VEE - Competitive Prototypes - Phase 1 Clinical Trials (Cont from VAC WEVEE)	1	2019	2	2021
VAC VEE - Competitive Prototypes - Manufacturing	1	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MB4 / *MEDICAL BIOLOGICAL DEFENSE (ACD&P)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
VAC VEE - Stability Testing	1	2019	4	2024
VAC VEE - Competitive Prototypes - Non-Clinical Studies	1	2019	1	2021
VAC VEE - Milestone B	4	2021	4	2021
VAC VEE - Selected Prototypes - Manufacturing	1	2022	2	2023
VAC VEE - Selected Prototype - Non Clinical Studies	1	2022	4	2024
VAC WEVEE - Non-Clinical Studies	1	2018	4	2018
VAC WEVEE - Manufacturing and Assay Development and Pilot Lots	1	2018	4	2018
VAC WEVEE - Phase 1 Clinical Trials	1	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MC4: *MEDICAL CHEMICAL DEFENSE (ACD&P)*	-	4.666	2.388	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.054
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

The program currently includes:
(1) Emerging Threats (EMRT)
(2) Improved Nerve Agent Treatment System (INATS)

The EMRT program is now called the Rapid Opioid Countermeasure System (ROCS) in FY20 MC5. The ROCS program is conducting the development 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 ROCS program will develop a naloxone autoinjector as a rescue treatment that will counteract the adverse effects from exposure to opioids.

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. Based on recent guidance from the FDA there is no longer a need to expand the pretreatment indications for pyridostigmine bromide (PB) beyond the nerve agent soman. Therefore, the Joint Project Manager for Chemical Defense Pharmaceuticals (JPdM CDP) will execute nonclinical studies to demonstrate the safety of PB when used as a pretreatment should agents other than soman be encountered. The INATS treatment regimen both improves the performance of, and eventually replaces the Antidote Treatment Nerve Agent Auto-injector (ATNAA). 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 2018	FY 2019	FY 2020
Title: 1) Emerging Threats	-	0.990	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Regulatory ***FY 2019 Plans:*** Initiate prototype development of an autoinjector. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred to another funding line.			
Title: 2) INATS - Oxime ***Description:*** Clinical ***FY 2019 Plans:*** Complete OXIME clinical studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	1.154	0.792	-
Title: 3) INATS - Oxime ***Description:*** Manufacturing ***FY 2019 Plans:*** Complete Chemistry, Manufacturing, and Controls (CMC) Manufacturing of trial material. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	0.730	0.300	-
Title: 4) INATS - Oxime ***Description:*** Nonclinical ***FY 2019 Plans:*** Complete rabbit, rat & NHP cause of death studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	2.782	0.306	-
Accomplishments/Planned Programs Subtotals	4.666	2.388	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MC5: *MEDICAL CHEMICAL DEFENSE (EMD)*	58.419	57.545	62.051	-	62.051	64.331	56.641	28.559	26.976	Continuing	Continuing
• JM6677: *ADVANCED ANTICONVULSANT SYSTEM (AAS)*	0.000	0.360	5.352	-	5.352	2.696	2.694	3.991	0.000	0.000	15.093

Remarks

D. Acquisition Strategy

EMERGING THREAT CHEMICAL THERAPEUTICS (EMRT)

The ROCS program is an approved Middle Tier/Rapid Prototyping acquisition program to develop the naloxone autoinjector within 5 years. A market survey has been conducted that identified several advanced development candidates. Other Transactional Authority agreements and Task Orders will be utilized to bring on board a commercial partner. Once FDA approval has been granted the program will transition from Rapid Prototyping to Rapid Fielding or a traditional production and fielding pathway.

IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

Oxime Component - The development of a new and improved oxime, MMB4, (replacing 2-PAM) to treat current and emerging nerve agent threats, is one component of the INATS Development Program. Both the oxime and the centrally acting components are required to address the current and emerging nerve agent threat and to mitigate their effects. MMB4 is a relatively new chemical entity transitioning from Science and Technology Development. MMB4 requires the conduct of studies to resume the Phase 1 Clinical Trial, preparation for the Phase 2 clinical trials, the manufacturing of the drug product for both these trials, the conduct of non-clinical studies to determine toxicity, and the conduct of premonitory studies to determine the impact of nerve transmissions.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMRT - HW C - Emerging Threats	C/CPFF	TBD : TBD	0.000	0.000		0.680	Jun 2019	0.000		-		0.000	0.000	0.680	0.000
INATS - HW C - CMC Manufacturing of trial material	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.460	0.389	Dec 2017	0.100	Dec 2018	0.000		-		0.000	0.000	0.949	0.000
		Subtotal	0.460	0.389		0.780		0.000		-		0.000	0.000	1.629	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
INATS - DTE S - Oxime Non-clinical Studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	3.658	1.734	Nov 2017	0.000		0.000		-		0.000	0.000	5.392	0.000
INATS - DTE C - Cause of Death studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.646	1.395	Oct 2017	0.146	Nov 2018	0.000		-		0.000	0.000	2.187	0.000
INATS - DTE C - Oxime Phase 1 Clinical Trial	C/CPFF	Battelle Memorial Institute : Columbus, OH	4.140	0.631	Nov 2017	0.632	Nov 2018	0.000		-		0.000	0.000	5.403	0.000
		Subtotal	8.444	3.760		0.778		0.000		-		0.000	0.000	12.982	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMRT - PM/MS C - Program Management (OPETS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.185	Dec 2018	0.000		-		0.000	0.000	0.185	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EMRT - PM/MS C - PM/MS S - Chemical and Biological Medical Systems	C/CPFF	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.125	Nov 2018	0.000		-		0.000	0.000	0.125	0.000
INATS - PM/MS C - JPEO	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.228	Dec 2018	0.000		-		0.000	0.000	0.228	0.000
INATS - PM/MS C - ADM Sustainment	C/CPFF	Ology : Alachua, FL	0.000	0.000		0.222	Dec 2018	0.000		-		0.000	0.000	0.222	0.000
INATS - PM/MS S - Chemical and Biological Medical Systems	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.440	0.517	Jan 2018	0.070	Dec 2018	0.000		-		0.000	0.000	2.027	0.000
		Subtotal	1.440	0.517		0.830		0.000		-		0.000	0.000	2.787	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.344	4.666		2.388		0.000		-		0.000	0.000	17.398	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*

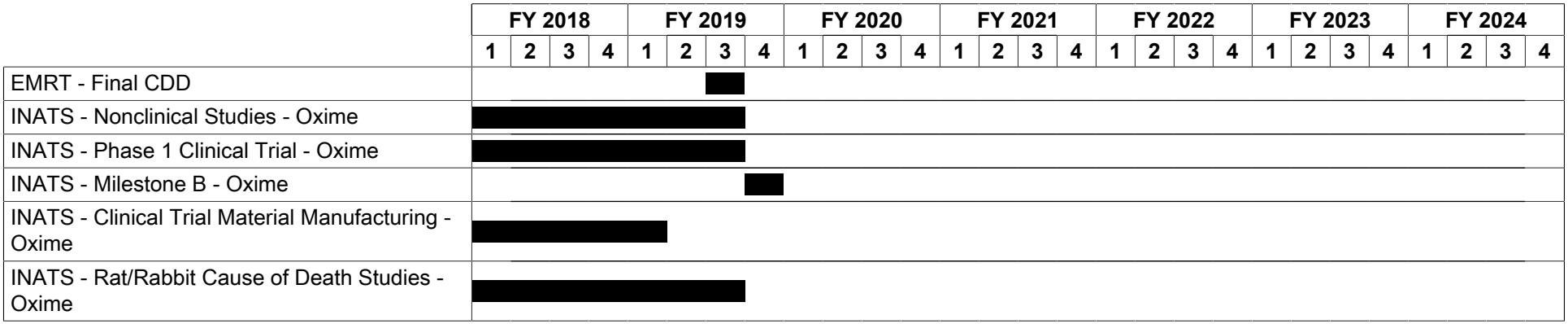

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** MC4 / *MEDICAL CHEMICAL DEFENSE (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EMRT - Final CDD	3	2019	3	2019
INATS - Nonclinical Studies - Oxime	1	2018	3	2019
INATS - Phase 1 Clinical Trial - Oxime	1	2018	3	2019
INATS - Milestone B - Oxime	4	2019	4	2019
INATS - Clinical Trial Material Manufacturing - Oxime	1	2018	1	2019
INATS - Rat/Rabbit Cause of Death Studies - Oxime	1	2018	3	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	Project (Number/Name) TE4 / *TEST & EVALUATION (ACD&P)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TE4: *TEST & EVALUATION (ACD&P)*	-	9.097	6.563	5.162	-	5.162	5.156	3.541	3.541	3.541	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Product Director, Test, Equipment, Strategy, and Support (PD TESS)/Chemical Biological Material Assessment Infrastructure (CBMAI) determines test infrastructure needs across the Chemical Biological Defense Portfolio (CBDP) and prioritizes RDT&E resources to support test planning and schedules/milestones for programs of record. Infrastructure improvements, modifications, or new development provide critical test capabilities for chemical, biological, and emerging threat products. CBMAI conducts studies and prototyping to enable rapid integration to support testing of detection, protection, and decontamination equipment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) PD TESS ***Description:*** PD TESS conducts requirements analysis to ensure the availability of needed test infrastructure to meet Program of Record (POR) testing and milestone schedules. Conduct studies of the capabilities and limitations of existing infrastructure and methodologies to align with POR test requirements. Expansion of a web-based test facility and capability database serves to maximize use of existing infrastructure. Development 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.	6.296	-	-
Title: 2) PD TESS ***Description:*** Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners.	2.801	-	-
Title: 3) CBMAI ***Description:*** Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners. ***FY 2019 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:***	-	2.375	1.802

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 4) CBMAI ***Description:*** 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. Expansion of a web-based test facility and capability database serves to maximize use of existing infrastructure. Development 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. ***FY 2019 Plans:*** Complete implementation of upgrades to NTA infrastructure to meet POR test requirements. Continue to study and prioritize future program requirements and test infrastructure needs. Develop and test evolving equipment to provide accurate protective ensemble performance data. Complete development and initiate implementation of a new detection technology to replace and significantly upgrade current chemical agent vapor monitoring capabilities. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	-	4.188	3.360
Accomplishments/Planned Programs Subtotals	9.097	6.563	5.162

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• TE5: *TEST & EVALUATION (EMD)*	14.532	9.056	7.775	-	7.775	7.975	7.377	7.376	7.375	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• TE7: *TEST & EVALUATION (OP SYS DEV)*	6.475	6.318	5.403	-	5.403	5.720	5.716	5.716	5.716	Continuing	Continuing

Remarks

D. Acquisition Strategy

TEST EQUIPMENT, STRATEGY & SUPPORT (PD TESS)

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

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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD TESS - HW SB - Chemical Defense Training Facility (CDTF) Enhancements	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.112	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - PD TESS - Real Time Referee Sensor (MeS)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	2.032	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.961	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - PD TESS - Chemical Defense Training Facility (CDTF) Enhancements	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.827	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - TI Analysis & Requirements	C/CPFF	MRIGlobal : Kansas City, MO	2.241	0.735	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Joint Ambient Breeze Tunnel Upgrades	C/CPFF	MRIGlobal : Kansas City, MO	0.665	1.537	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Open Architecture Data Management System	C/CPFF	MRIGlobal : Kansas City, MO	0.405	0.347	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - Test Infrastructure - HW S - NTA Defense Test System Design/Fabrication/ Installation	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	21.345	0.225	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - Test Infrastructure - HW S - Analysis & Requirements Capability Analyses	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.595	0.327	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - Test Infrastructure - HW S -	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.154	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Open Architecture Data Management Systems															
CBMAI - HW C - Product Contractor Development Team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.000	0.000		0.105	Feb 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - NTADTS	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.300	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Multi Commodity Agent Chamber (MCAC)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		1.090	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - HD Sensor	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		1.212	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - TI Analysis and Requirements	C/CPFF	Various : Various	0.000	0.000		0.641	Dec 2018	3.360	Dec 2019	-		3.360	Continuing	Continuing	0.000
CBMAI - HW S - Real Time Man in Simulant Test (MIST) Sensor	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.564	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Ballistic Gas Chromatograph (GC)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.326	Dec 2018	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	0.000		1.300	Dec 2018	0.774	Nov 2019	-		0.774	Continuing	Continuing	0.000
		Subtotal	26.251	7.257		5.538		4.134		-		4.134	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBMAI - TD/D S - TECA	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.075	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		0.075		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD TESS - PM/MS S - IPT Support/Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	13.224	1.840	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - PM/MS C - IPT Support/Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.950	Dec 2018	1.028	Dec 2019	-		1.028	Continuing	Continuing	0.000
		Subtotal	13.224	1.840		0.950		1.028		-		1.028	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.475	9.097		6.563		5.162		-		5.162	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

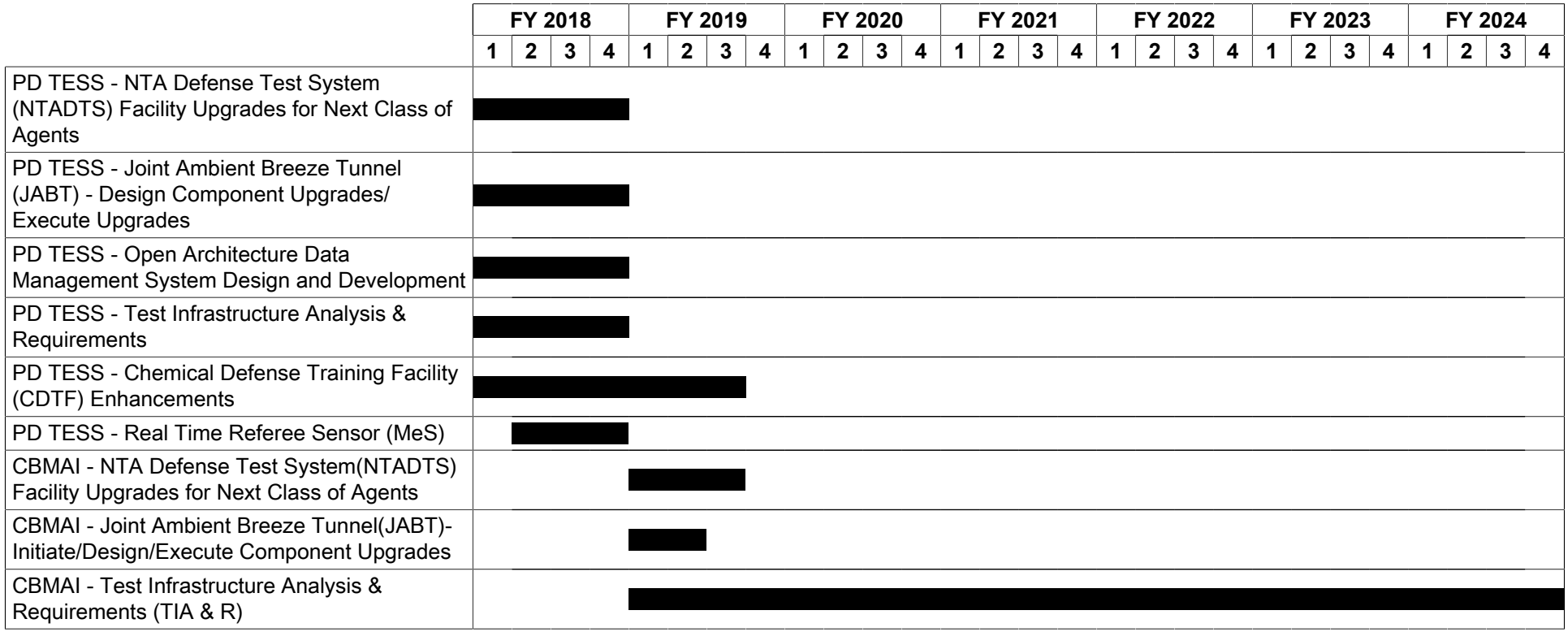

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0603884BP / *CHEMICAL/BIOLOGICAL DEFENSE (ACD&P)*	**Project (Number/Name)** TE4 / *TEST & EVALUATION (ACD&P)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PD TESS - NTA Defense Test System (NTADTS) Facility Upgrades for Next Class of Agents	1	2018	4	2018
PD TESS - Joint Ambient Breeze Tunnel (JABT) - Design Component Upgrades/ Execute Upgrades	1	2018	4	2018
PD TESS - Open Architecture Data Management System Design and Development	1	2018	4	2018
PD TESS - Test Infrastructure Analysis & Requirements	1	2018	4	2018
PD TESS - Chemical Defense Training Facility (CDTF) Enhancements	1	2018	3	2019
PD TESS - Real Time Referee Sensor (MeS)	2	2018	4	2018
CBMAI - NTA Defense Test System(NTADTS) Facility Upgrades for Next Class of Agents	1	2019	3	2019
CBMAI - Joint Ambient Breeze Tunnel(JABT)- Initiate/Design/Execute Component Upgrades	1	2019	2	2019
CBMAI - Test Infrastructure Analysis & Requirements (TIA & R)	1	2019	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	368.151	358.608	384.047	-	384.047	293.026	225.919	191.500	192.958	Continuing	Continuing
CA5: *CONTAMINATION AVOIDANCE (EMD)*	-	95.134	111.781	131.985	-	131.985	75.093	53.146	38.807	38.987	Continuing	Continuing
CM5: *HOMELAND DEFENSE (EMD)*	-	15.513	6.000	12.646	-	12.646	0.000	0.000	0.000	0.000	0.000	34.159
CO5: *COLLECTIVE PROTECTION (EMD)*	-	8.833	11.307	7.322	-	7.322	6.918	1.497	0.000	0.000	0.000	35.877
DE5: *DECONTAMINATION SYSTEMS (EMD)*	-	10.162	14.049	8.267	-	8.267	10.260	11.094	19.285	17.769	Continuing	Continuing
IP5: *INDIVIDUAL PROTECTION (EMD)*	-	13.529	9.324	12.663	-	12.663	13.013	11.162	11.343	11.342	Continuing	Continuing
IS5: *INFORMATION SYSTEMS (EMD)*	-	21.789	22.215	22.111	-	22.111	17.935	13.781	7.695	7.694	Continuing	Continuing
MB5: *MEDICAL BIOLOGICAL DEFENSE (EMD)*	-	130.240	117.331	119.227	-	119.227	97.501	71.221	78.435	82.815	Continuing	Continuing
MC5: *MEDICAL CHEMICAL DEFENSE (EMD)*	-	58.419	57.545	62.051	-	62.051	64.331	56.641	28.559	26.976	Continuing	Continuing
TE5: *TEST & EVALUATION (EMD)*	-	14.532	9.056	7.775	-	7.775	7.975	7.377	7.376	7.375	Continuing	Continuing

A. Mission Description and Budget Item Justification

The projects in this PE support the development, build, and test of products to verify 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 CBR contamination and prevent further cross-contamination during operations.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*

- 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.

- Decontamination Systems (DE5): system development of Contamination Mitigation (ConMit) systems utilizing solutions that will remove 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 DoD acquisition system and are therefore correctly placed in Budget Activity 5.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	406.789	388.701	337.454	-	337.454
Current President's Budget	368.151	358.608	384.047	-	384.047
Total Adjustments	-38.638	-30.093	46.593	-	46.593
• Congressional General Reductions	-0.054	-0.093			
• Congressional Directed Reductions	-37.902	-44.000			
• Congressional Rescissions	-	-			
• Congressional Adds	7.000	14.000			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.789	-			
• SBIR/STTR Transfer	-6.893	-			
• Other Adjustments	0.000	-	46.593	-	46.593

Change Summary Explanation

Funding: FY18: (-$0.054M) Congressional General Reductions and (-$37.902M) Congressional Directed Reductions.
FY18 (+$7.000M): Congressional Adds for Filtration Systems (+$2.000M) and Antiviral Prophylaxis Studies (+$5.000M).
FY18 (-$6.893M): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.
FY18 (-$.789M): Program Reprogrammings.

FY19: (-$0.093M) Congressional General Reductions and (-$44.000M) Congressional Directed Reductions.
FY19 (+$14.000M): Congressional Adds for Filtration Systems (+$2.000M) and Antiviral Prophylaxis Studies (+$12.000M).

FY20 (+$10.000M): Program Increase for Advanced Development and Manufacturing (ADM) Capability Development .
FY20 (+$36.593M): Program adjustments to balance overall portfolio efforts and resource Services highest priority detection, protection, and MCM development efforts.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CA5: *CONTAMINATION AVOIDANCE (EMD)*	-	95.134	111.781	131.985	-	131.985	75.093	53.146	38.807	38.987	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) Aerosol & Vapor Chemical Agent Detector (AVCAD)
(2) Enhanced Maritime Biological Detection (EMBD)
(3) The Joint Handheld Bio-Agent Identifier (JHBI)
(4) Mounted Manned Platform Radiological Detection System (MMPRDS)
(5) Multi-Phase Chemical Agent Detector (MPCAD)
(6) Proximate Chemical Agent Detector (PCAD)
(7) Reactive Chemistry Orthogonal Surface and Environmental Threat Ticket Array (ROSETTA)
(8) Joint Nuclear Biological Chemical Radiological System (JNBCRS) 1, also known as Stryker Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRV SS)
(9) Joint Biological Tactical Detection System (JBTDS)
(10) Next Generation Chemical Detector (NGCD 1,2,3,4)
(11) Non-Traditional Agent (NTA) Defense Support; (12) the Global Biosurveillance Technology Initiatives (GBTI)

In FY18, the Next Generation Chemical Detector (NGCD) funding line was broken out into NGCD 1, 2, 3, and 4. Starting in FY19, four program unique funding lines exist: AVCAD (formerly NGCD 1), PCAD (formerly NGCD 2), MPCAD (formerly NGCD 3), and WCAD (formerly NGCD 4). NGCD will detect and identify non-traditional agents, chemical warfare agents (CWA), toxic industrial chemicals (TICs) in the air and on surfaces. The NGCD will provide improved NTA/CWA/TIC selectivity and sensitivity in multiple environments. The sensors will improve detection, consequence management and reconnaissance, and weapons of mass destruction (WMD) interdiction capabilities. The scope of the project includes Presumptive detection (AVCAD, PCAD, WCAD) and field level Confirmation, Identification, and Quantification (MPCAD) detection of chemicals a few feet away from the detector as well as at the sampling point of the detector. Additional tasks will ruggedize and test a system for nontraditional agent detection for special purpose units. NGCD funded a USSOCOM effort to develop a modification kit to JCAD to address NTA and threats of interests going into the SP SKO and SPU units.

The AVCAD supports the Priority Objective to deny the effects of current and emerging threats. The AVCAD system will be the first chemical aerosol detector fielding by any military, worldwide. 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. In FY20, AVCAD will support testing and continue development of the EMD phase.

The MPCAD provides all states of matter, to include chemical solids, liquids, aerosols and vapors, and will support the Commander's tactical and operational decisions regarding avoidance, protection, and decontamination measures and immediate treatment by providing real-time, near-laboratory grade sample analysis. 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.

The PCAD provides the Joint Services a handheld capability to locate and detect trace amounts of liquids and solids on surfaces. 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, Edgewood Chemical and Biological Center (ECBC) was exploring the use of adapting the Joint Chemical Agent Detector (JCAD) to detect explosives. The project was called JCAD Chemical Explosive Detector (CED). The theory of operation is a JCAD is inserted into a cradle that has a heated inlet and modified library to detect explosives. An operator swabs a surface with a probe and inserts the probe into heated inlet and the resulting vapors are interrogated by the JCAD. The effort was expanded for the system to detect NTAs, and Pharmaceutical Based Agents (PBAs). The program changed its name to JCAD Solid/Liquid Adapter (SLA) kit to better match its true capabilities. 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.

The MMPRDS provides advanced platform-mounted radiological/nuclear (RN) crew monitoring/detection, reconnaissance, and surveillance for multiple manned and unmanned U.S. Army ground and rotary wing vehicles. The system, which can also be integrated into fixed site sensor payloads, provides both point (VIPER prototype) and standoff (MERLIN prototype) RN detection capabilities that replace AN/UDR-13 and AN/VDR-2 systems. Funding supports advanced development of MERLIN and VIPER prototypes for integration onto the Stryker NBCRV and medium-sized unmanned ground platforms. VIPER will also be integrated into the M1A2, Bradley, Black Hawk, and other major U.S. Army platforms (for point detection).

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, 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 complete production and testing, integration and field a lower cost biological

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

point detection system. In FY20, EMBD will complete EMD (Engineering and Manufacturing Development) DT/OT (Developmental Testing/Operational Testing) and move to Milestone C.

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 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 8 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. JHBI transitioned from JBTDS to its own funding line in FY18.

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 especially micro-sized unmanned aerial sensors. 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.

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.

The JBTDS program is developing, integrating and testing the first lightweight, low-cost biological surveillance system to detect, collect, and identify Biological Warfare Agent (BWA) aerosols. JBTDS provides warning through the Joint Warning and Reporting Network (JWARN) and archives samples for follow-on analyses. JBTDS provides near real-time local audio and visual alarm and may be employed by any Military User. JBTDS components are man-portable, battery-operable and easy to employ. JBTDS provides notification of a hazard and enhances battle space awareness to protect and preserve the forces. 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

The JBTDS provides surface sampling capability which interfaces with the JBTDS identifier to support sensitive site exploitation missions. In FY20, JBTDS will complete program record testing and prepare for a Milestone decision.

The NTA Defense Program is the Joint Project Executive Office of Chemical Biological Radiological and Nuclear Defense (JPEO CBRND) lead for DoD, Interagency, and international work pertaining to 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 commodity areas. System prototyping and modification efforts serve to advance capabilities, reduce risk, and provide improved knowledge for decision making.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Next Generation Chemical Detector (NGCD) ***Description:*** NGCD acceleration contract for USSOCOM and Special Purpose Sets, Kits, and Outfits (SP SKO) JCAD CED.	2.169	-	-
Title: 2) Next Generation Chemical Detector (NGCD) 1-3 ***Description:*** Program Management	6.086	-	-
Title: 3) NGCD 1 ***Description:*** NGCD 1 (AVCAD) EMD Contract	6.205	-	-
Title: 4) NGCD 3 ***Description:*** NGCD 3 (MPCAD)- EMD Contract	9.000	-	-
Title: 5) NGCD 1 ***Description:*** NGCD 1 (AVCAD) - Test	0.818	-	-
Title: 6) NGCD 2 ***Description:*** NGCD 2 (PCAD) - Test	0.565	-	-
Title: 7) NGCD 3	0.750	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: NGCD 3 (MPCAD) - Test			
Title: 8) Aerosol & Vapor Chemical Agent Detector (AVCAD) ***Description:*** EMD Contracts ***FY 2019 Plans:*** Continue EMD development and support risk reduction chamber testing for Production Qualification Test. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule. Schedule delay due to contract award	-	4.231	13.802
Title: 9) Aerosol & Vapor Chemical Agent Detector (AVCAD) ***Description:*** Test and Evaluation ***FY 2019 Plans:*** Initiate and conduct risk reduction testing and OGA test support. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	2.807	3.980
Title: 10) Aerosol & Vapor Chemical Agent Detector (AVCAD) ***Description:*** Program Management Support ***FY 2019 Plans:***	-	3.657	4.027

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 11) Multi-Phase Chemical Agent Detector (MPCAD) ***Description:*** Product Development ***FY 2019 Plans:*** Initiate Two EMD contracts. Conduct Preliminary Design Review (PDR), purchase five test articles at 150K each for customer test. ***FY 2020 Plans:*** Continue up to two EMD contract(s), Government and contracted Integrated Product Development team, program management, systems engineering and IPT Support. Incorporate fixes and purchase 26 test articles at 150K each to conduct testing and operational assessment to support Milestone C decision. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	16.690	17.477
Title: 12) Multi-Phase Chemical Agent Detector (MPCAD) ***Description:*** Testing ***FY 2019 Plans:*** Initiate and conduct Library Build and System Verification. ***FY 2020 Plans:*** 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, and	-	4.289	13.166

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
OT Limited User Test. Continue OGA support of development and testing of MPCAD systems including development of logistics product, test plans, and conducting tradeoff discussions. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters. Late contract award in FY18 shifted program priorities			
Title: 13) Multi-Phase Chemical Agent Detector (MPCAD) ***Description:*** Program Management Support ***FY 2019 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	4.613	5.189
Title: 14) Proximate Chemical Agent Detector (PCAD) ***Description:*** EMD Contract & Test and Evaluation ***FY 2019 Plans:*** Complete EMD contract. Purchase 50 low rate production systems for Production Verification Testing. Initiate and complete development testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Advanced Technology Development technology will transition back to S&T for further maturity	-	6.025	-
Title: 15) Proximate Chemical Agent Detector (PCAD) ***Description:*** Program Management Support ***FY 2019 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	2.524	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program/project transitioned to Advanced Technology Development technology will transition back to S&T for further maturity			
Title: 16) EMBD ***Description:*** Product Development ***FY 2019 Plans:*** Continue Government system engineering, program/financial management, and costing in support of the EMBD program. Purchase ten systems ($550K ea.) for government DT/Operational Assessment (OA), ILS development, design and software finalization. Continue ARCA support and data analysis for RAAD Detector, TDP transfer to Prime Contractor from MIT, conduct obsolescence analysis and modify software (SW) algorithms. ***FY 2020 Plans:*** 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 SW support for test and OA, and finalize SW support and transition to Prime Contractor. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase. EMD completes in FY20	9.074	10.439	5.947
Title: 17) EMBD ***Description:*** Program management support and Test & Evaluation ***FY 2019 Plans:*** Continue combat developer, test community and Service representation during EMD Phase. Initiate false alarm and component live agent testing and purchase consumables for testing. Continue program management support including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	3.041	4.575	7.220

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Minor change due to routine program adjustments. OT is only being conducted in FY20			
Title: 18) GBTI	3.575	2.108	-
Description: 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 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			
FY 2019 Plans: Complete transition of support for Targeted Acquisition of Reference Materials Augmenting Capabilities (TARMAC) under GBTI to the Defense Biological Products Assurance Program (DBPAP) project MB5 line in FY20.			
FY 2019 to FY 2020 Increase/Decrease Statement: Program/project is entering completion and all activities will be closed.			
Title: 19) JBTDS: Product Development	13.464	9.356	6.319
Description: EMD Contract			
FY 2019 Plans: Continue Government system engineering, program/financial management, and costing in support of the JBTDS program. Continued EMD contract for product development, networking solution, program management support, and product team support. Continue development for on-the-move capability. Contractor will conclude delivery of Identifiers ($57.3K/ea.), Collectors ($17.5K/ea.) and Detector/Collectors ($28K/ea.). JBTDS will continue with the ARCA development efforts, live agent production and participation in the BPSA events and complete live agent testing to support multiple Chemical Biological Defense programs of record requirements.			
FY 2020 Plans: 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.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Minor change due to routine program adjustments.			
Title: 20) JBTDS: Program Support ***Description:*** Program Management Support and Test & Evaluation ***FY 2019 Plans:*** Continue sensor calibration, combat developer, test community and service representation support. Continued verification and validation of military utility model/CBACE. Continue developmental planning and testing to include MIL-STD phase II, interoperability test, shipboard ops test, chamber validation and accreditation, collector characterization tests, live agent test and operational assessment (OA). Continue production of Biological Warfare Agents (BWA) for live agent test, collector characterization test, and shelf-life assay test. Continue program management support including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Complete sensor calibration. Complete the verification and validation of military utility model/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 BWA for testing. Complete live agent and collector characterization developmental testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments. Ramping down due to MS C in FY20	10.665	14.133	8.033
Title: 21) JHBI ***Description:*** JHBI system development, developmental testing, and operational assessment.	1.740	-	-
Title: 22) JNBCRS 1 (NBCRV SSU) ***Description:*** CBRN Sensor Development and Integration ***FY 2019 Plans:*** Continued CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continued government strategic planning, systems engineering, logistics, training, test and evaluation, and technical support. Initiated NBCRV SSU acceleration effort with the bulk of integration product development occurring in FY20. ***FY 2020 Plans:***	22.387	18.230	24.587

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continued 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.			
Title: 23) JNBCRS 1 (NBCRV SSU) ***Description:*** Program Management Support ***FY 2019 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.	3.273	2.425	4.340
Title: 24) MMPRDS ***Description:*** The Mounted Manned Platform Radiological Detection System (MMPRDS) provides advanced platform-mounted radiological/nuclear (RN) crew monitoring/detection, reconnaissance, and surveillance for multiple manned and unmanned U.S. Army ground and rotary wing vehicles. The system, which can also be integrated into fixed site sensor payloads, provides both point (VIPER prototype) and standoff (MERLIN prototype) RN detection capabilities that replace AN/UDR-13 and AN/VDR-2 systems. Funding supports advanced development of MERLIN and VIPER prototypes for integration onto the Stryker NBCRV and medium-sized unmanned ground platforms. VIPER will also be integrated into the M1A2, Bradley, Black Hawk, and other major U.S. Army platforms (for point detection). ***FY 2019 Plans:*** Conduct Developmental Testing of delivered prototypes, modify to close performance gaps remaining following technology transition from Defense Threat Reduction Agency (DTRA). Conduct necessary cybersecurity activities per Risk Management Framework (RMF). ***FY 2020 Plans:***	-	2.500	10.140

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Execute developmental testing and begin operational testing on newly integrated systems received from OTA manufacturers to close test gaps remaining following technology transition, to support TEMP completion and to support a materiel release. Continue to evaluate and modify delivered prototypes to close performance gaps remaining following technology transition. Conduct necessary cybersecurity activities per Risk Management Framework (RMF). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 25) NTA Defense ***Description:*** NTA Defense program provides assessment, modification, and testing of detection, protection, and decontamination capabilities to protect the Joint Services against emerging threats, to include PBAs. Specific efforts include: purchase, test and assessment of COTS/GOTS equipment; test and assessment 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 integrate new equipment and techniques to provide improved sample collection and decontamination of PBAs. ***FY 2019 Plans:*** Update COTS detection equipment Market Survey for emerging technology, to include updates to web-based interface for interagency use. Purchase COTS equipment for lab testing against PBAs. Continuation of FY18 studies on the efficacy of protective equipment against various forms of PBAs. ***FY 2020 Plans:*** Update 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	1.937	1.023	2.900
Title: 26) NTA Defense ***Description:*** Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners ***FY 2019 Plans:***	0.385	0.177	0.794

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 27) ROSETTA ***Description:*** Contract Award for Development Effort ***FY 2019 Plans:*** Initiate award of OTA contract to fund vendors to develop and provide prototypes for testing and support technical data package development. ***FY 2020 Plans:*** Continue award of OTA to complete the development and testing of prototype effort. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase. ECP to existing M256A2 kit	-	1.979	4.064
Accomplishments/Planned Programs Subtotals	95.134	111.781	131.985

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• CA4: *CONTAMINATION AVOIDANCE (ACD&P)*	30.844	31.527	19.074	-	19.074	8.864	8.215	15.106	13.706	Continuing	Continuing
• JF0100: *JOINT CHEMICAL AGENT DETECTOR (JCAD)*	4.483	1.698	4.493	-	4.493	6.828	7.574	8.197	8.368	Continuing	Continuing
• MC0100: *JOINT NBC RECONNAISSANCE SYSTEM (JNBCRS)*	0.468	0.000	0.300	-	0.300	0.300	0.300	7.981	7.981	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MC0101: *CBRN DISMOUNTED RECONNAISSANCE SYSTEMS (CBRN DRS)*	69.945	98.081	53.020	-	53.020	45.344	50.798	55.510	43.067	Continuing	Continuing
• MX0001: *JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)*	0.000	0.000	0.000	-	0.000	47.915	50.785	65.244	60.849	Continuing	Continuing

Remarks

D. Acquisition Strategy

NEXT GENERATION CHEMICAL DETECTOR (NGCD)

In FY19 NGCD program divides into separate three programs. Efforts will continue in FY19 under the separate programs, AVCAD, PCAD, MPCAD funding lines.

AEROSOL VAPOR CHEMICAL AGENT DETECTOR (AVCAD)

Aerosol & Vapor Chemical Agent Detector (AVCAD) awarded MS B Engineering and Manufacturing Development (EMD) contracts with production options. The AVCAD program will conduct risk reduction testing with prototypes prior to full EMD DT Testing to support the MSC/LRIP decision.

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 Combating Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for EMD 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.

PROXIMATE CHEMICAL AGENT DETECTOR (PCAD)

The Proximate Chemical Agent Detector (PCAD) (formerly NGCD 2) supports the efforts associated with the PCAD Analysis of Alternatives (AoA). The AoA is reassessing the PCAD Capability requirements with each of the Joint Services and determining the state of technologies necessary to meet the users capability needs. It is believed that technology will need to transition back to S&T to further mature. In the interim the program office will support the JCAD SLA kit design finalization by continuing to fund the JCAD manufacturer, Smith's Detection Inc. to complete its addition of an NTA and opioid libraries, test and evaluate the system and to incorporate the JCAD SLA kit as an Additional Authorized List (AAL) item to the M4A1 JCAD program. The production decision is the approval of the Engineering Change Proposal (ECP) that adds the JCAD SLA as an AAL item to the M4A1 JCAD.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

ENHANCED MARITIME BIOLOGICAL DETECTION (EMBD)

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).

GLOBAL BIO TECH INITIATIVE (GBTI)

The Global Biosurveillance Technology Initiative (GBTI) strategy establishes a robust data stream that directly supports existing programs of record in their development of biological defense countermeasures through the characterization of laboratory networks and augmentation of key nodes within those networks. This will be accomplished through the use of 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.

JOINT BIO TACTICAL DETECTION SYSTEM (JBTDS)

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). JBTDS is funding and participating in the Biological Point System Assessment (BPSA). BPSA provides an assessment of all biological detection, collection, and identification alternative technologies to assess system maturity, suitability and effectiveness to meet JBTDS requirements.

JOINT HANDHELD BIO-AGENT IDENTIFIER (JHBI)

The JHBI program will pursue a collaborative accelerated acquisition strategy to incrementally deliver capability to USSOCOM. JHBI will use commercial items to procure candidate systems from two vendors for further development and fielding. JHBI is co-managed and co-executed through an acquisition partnership between the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD) and USSOCOM to expand the relationship between JPEO-CBD and USSOCOM and leverage acquisition and subject matter expertise on both sides to reduce acquisition timelines and improve customer satisfaction. Specifically, JHBI is using the USSOCOM requirement validation and test and evaluation resources from program inception through Milestone C, awarded 3Q18. Developmental Testing (DT) was completed in 2QFY18. Full Rate Production (FRP) will begin 4QFY18. 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.

JOINT NBC RECONNAISSANCE SYSTEM - STRYKER (JNBCRS)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

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 2019 and system level testing. Following the testing and demonstration, the hardware and software will be fixed and updated for Joint Warfighter Assessment 2020 and test. 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.

MOUNTED MANNED PLATFORM RADIOLOGICAL DETECTION SYSTEM (MMPRDS)

The Mounted Manned Platform Radiological Detection System (MMPRDS) is a Modified Work Order of the Stryker Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade's radiological sensor system. MMPRDS includes interior-mounted (VIPER) to detect and protect the crew and exterior-mounted (MERLIN) vehicle sensors to facilitate radiological reconnaissance. This is a rapid development of an enhanced radiological sensor system using rapid prototypes transitioned from Defense Threat Reduction Agency-Nuclear Technologies (DTRA/NT) in September 2018. The MMPRDS is utilizing the Combating Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) for the production ready test assets. The MMPRDS will procure production items through a Federal Acquisition Regulation based contract.

NON TRADITIONAL AGENT DEFENSE (NTA DEFENSE)

The NTA Defense program will transition information, technologies, and capabilities for PBAs and other emerging threats into existing and future acquisition programs (PORs, ECD/ACDs, and Accelerated Acquisition) and utilize a variety of contract mechanisms (full and open competition, existing task order contracts within DoD).

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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - HW C - HW S - NGCD 3	C/CPIF	Signature Science : Austin, TX	0.000	4.500	Sep 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW C - HW-NGCD1	C/CPIF	Smiths Detection : Edgewood, MD	0.000	3.839	Sep 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - Prototype Build JCAD-CED	C/CPIF	Smiths Detection : Edgewood, MD	8.297	2.169	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - NGCD 1	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	0.000	2.366	Sep 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - HW S - NGCD 3	C/CPIF	FLIR Systems Inc. : West Lafayette, IN	0.000	4.500	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - HW C - In-house labor and contract support	MIPR	Various : Various	0.000	0.000		1.592	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - HW S - Aerosol & Vapor Chemical Agent Detector EMD Contract	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	0.000	0.000		1.059	Jan 2019	6.901	Oct 2019	-		6.901	Continuing	Continuing	0.000
AVCAD - HW S - Aerosol & Vapor Chemical Agent Detector EMD Contract #2	C/CPIF	Smiths Detection : Edgewood, MD	0.000	0.000		3.172	Jan 2019	6.901	Oct 2019	-		6.901	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract - Sig Sci	C/CPFF	Signature Science : Austin, TX	0.000	0.000		11.959	Mar 2019	5.994	Mar 2020	-		5.994	Continuing	Continuing	0.000
MPCAD - PM/MS S - Inhouse Labor and Contract Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		1.418	Nov 2018	3.041	Jan 2020	-		3.041	Continuing	Continuing	0.000
MPCAD - HW S - EMD Contract - FLIR	C/CPFF	FLIR Systems Inc. : West Lafayette, IN	0.000	0.000		4.731	Mar 2019	8.442	Mar 2020	-		8.442	Continuing	Continuing	0.000
PCAD - HW C - PM/MS S - Inhouse Labor and Contract Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO,	0.000	0.000		1.081	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Aberdeen Proving Ground, MD													
PCAD - HW S - JCAD SLA Kit finalization	SS/CPIF	Smiths Detection : Edgewood, MD	0.000	0.000		4.250	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - Product Development Support	MIPR	Various : Various	0.000	1.680	Jan 2018	1.181	Feb 2019	1.152	Mar 2020	-		1.152	Continuing	Continuing	0.000
EMBD - Product Contractor development team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.000	0.081	Feb 2018	0.128	Feb 2019	0.130	Feb 2020	-		0.130	Continuing	Continuing	0.000
EMBD - Prototype Development	SS/FFP	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.600	1.180	Jul 2018	1.290	Feb 2019	1.000	Feb 2020	-		1.000	Continuing	Continuing	0.000
EMBD - HW - Prototype Development and Manufacturing	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	0.000	5.557	Jul 2018	7.840	Feb 2019	3.665	Feb 2020	-		3.665	Continuing	Continuing	0.000
EMBD - Hardware Development and Integration	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.750	0.576	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - HW - EMD Contract Award	C/CPIF	Chemring Detection Systems : Inc., Charlotte, NC	23.688	5.051	Dec 2017	2.000	Jan 2019	1.850	Nov 2019	-		1.850	Continuing	Continuing	0.000
JBTDS - Product Cotractor Support Team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.964	0.234	Feb 2018	0.278	Feb 2019	0.280	Feb 2020	-		0.280	Continuing	Continuing	0.000
JBTDS - Product Contractor Cost Support Team	C/FFP	Tecolote Research Inc : Arlington, VA	0.463	0.153	Feb 2018	0.155	Feb 2019	0.157	Jan 2020	-		0.157	Continuing	Continuing	0.000
JBTDS - Product Development Support - Labor, Travel, & GPC	MIPR	Various : Various	16.812	2.318	Jan 2018	3.751	Nov 2018	4.032	Nov 2019	-		4.032	Continuing	Continuing	0.000
JHBI - JHBI - Product Development	SS/FFP	Biomeme : Philadelphia, PA	0.000	1.110	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - AGENTASE LLC (FLIR),	C/CPFF	AGENTASE : LLC, Elkridge, MD	0.000	1.978	Nov 2017	1.700	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Elkridge MD - CSD Contract															
JNBCRS 1 - HW C - L-3 Communications - CSD Contract	C/CPFF	L-3 Communications : Santa Rosa, CA	0.000	1.959	Nov 2017	1.850	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - SW C Software Integration	C/CPFF	TBD : TBD	0.000	0.000		0.958	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - Hamilton Sundstrand (UTAS) - CSD Contract	C/CPFF	Hamilton Sundstrand Corp. : Pomona, CA	0.000	1.058	Feb 2018	0.295	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - iMCAD	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	1.752	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW-Sensor Suite Development	C/CPIF	Various : Various	0.000	6.282	Nov 2017	5.354	Feb 2019	12.075	Nov 2019	-		12.075	Continuing	Continuing	0.000
JNBCRS 1 - HW C - Platform	C/FFP	General Dynamics Land Systems : Detroit, MI	0.000	0.800	Jul 2018	0.400	May 2019	0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - ECBC (Matrix) - Reimbursable Labor	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.592	Jan 2018	1.855	Nov 2018	2.292	Nov 2019	-		2.292	Continuing	Continuing	0.000
JNBCRS 1 - HW C - JHU-APL (NAVSEA) (LIDAR)	C/FFP	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	1.000	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - HW C - VIPER / MERLIN	C/CPFF	Advanced Technologies International : Summerville, SC	0.000	2.570	Nov 2017	3.155	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
MMPRDS - HW C - MMPRDS - Product Refinement	C/CPFF	TBD : TBD	0.000	0.000		2.186	Dec 2018	5.200	Dec 2019	-		5.200	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NTA DEFENSE - HW S - Capabilities Assessments	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.301	Mar 2018	0.101	Dec 2018	0.300	Dec 2019	-		0.300	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Capabilities Assessments #2	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		0.400	Jan 2020	-		0.400	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Capabilities Assessment	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.047	Jun 2018	0.100	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - HW S - System Protoype and Modification	C/CPFF	Various : Various	0.000	0.000		0.050	Apr 2019	1.500	Dec 2019	-		1.500	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.097	Nov 2017	0.000		0.240	Dec 2019	-		0.240	Continuing	Continuing	0.000
NTA DEFENSE - HW S - Fielded Equipment Characterization	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.763	0.455	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
ROSETTA - Technical Data Package	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.400	Apr 2020	-		0.400	Continuing	Continuing	0.000
ROSETTA - Technical Manuals	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.400	Apr 2020	-		0.400	Continuing	Continuing	0.000
ROSETTA - HW C-Contract Award	C/FFP	TBD : TBD	0.000	0.000		1.357	Jul 2019	0.400	Jul 2020	-		0.400	Continuing	Continuing	0.000
		Subtotal	53.337	55.205		65.246		66.752		-		66.752	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - ES S - Joint Service T&E/SE IPT	MIPR	Various : Various	2.477	0.818	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - Non-test OGA support	MIPR	Various : Various	0.000	0.000		0.000		4.027	Nov 2019	-		4.027	Continuing	Continuing	0.000
PCAD - ES C - PM/MS S - OGA Support PCAD - Test Planning	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	0.000		0.150	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - ES - OTA/OGA USN Variant Support	MIPR	Various : Various	0.000	0.000		0.175	Feb 2019	0.025	Mar 2020	-		0.025	Continuing	Continuing	0.000
EMBD - ES S - Software support	MIPR	Armament Research : Development and Engineering Center, Piccatinny, NJ	0.000	0.093	Feb 2018	0.075	Feb 2019	0.075	Feb 2020	-		0.075	Continuing	Continuing	0.000
EMBD - ES S - Test Planning Support	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.000	0.208	Feb 2018	0.200	Feb 2019	0.200	Feb 2020	-		0.200	Continuing	Continuing	0.000
EMBD - ILS S - Logistics Support	MIPR	TACOM : Warren, MI	0.000	0.000		0.100	Feb 2019	0.100	Feb 2020	-		0.100	Continuing	Continuing	0.000
EMBD - ES C - Navy Service Support	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.859	Feb 2018	0.600	Feb 2019	0.606	Feb 2020	-		0.606	Continuing	Continuing	0.000
EMBD - ES S - Test Planning Support #2	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.100	Feb 2019	0.100	Feb 2020	-		0.100	Continuing	Continuing	0.000
JBTDS - ES - ECBC - DPG	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.450	Jan 2019	0.750	Nov 2019	-		0.750	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBTDS - ES - Engineering Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	2.139	0.286	Dec 2017	0.565	Jan 2019	0.170	Nov 2019	-		0.170	Continuing	Continuing	0.000
JBTDS - ES - Reliability Growth Model/CBACE	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.043	0.270	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - ES - Biosensor Calibration Effort	MIPR	Naval Research Lab (NRL) : Washington, DC	2.463	0.159	Mar 2018	0.318	Jan 2019	0.150	Nov 2019	-		0.150	Continuing	Continuing	0.000
JBTDS - ES - OTA/OGA Service Representation	MIPR	Various : Various	6.690	2.348	Mar 2018	2.549	Jan 2019	2.735	Nov 2019	-		2.735	Continuing	Continuing	0.000
JHBI - ES S - Technical Support	Various	Various : Various	0.000	0.256	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - ES - Engineering Support	MIPR	Various : Various	0.000	2.222	Nov 2017	0.000		2.750	Nov 2019	-		2.750	Continuing	Continuing	0.000
NTA DEFENSE - ES S - Capabilities Assessment	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.033	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	13.812	7.552		5.282		11.688		-		11.688	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - JCAD CED - Customer Testing	MIPR	Various : Various	0.000	0.565	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NGCD - Customer Testing	MIPR	Various : Various	0.000	0.750	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - V&V efforts	MIPR	Various : Various	0.000	0.000		0.675	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AVCAD - DTE C - Risk Reduction Chamber Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.950	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - OGA Test Support	MIPR	Various : Various	0.000	0.000		0.190	Dec 2018	0.600	Nov 2020	-		0.600	Continuing	Continuing	0.000
AVCAD - DTE C - Accreditation & Chemicals	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.200	Mar 2019	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - Radio RFI and test	MIPR	Various : Various	0.000	0.000		0.692	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - DTE C - DT/OT Chemical Chamber, MIL-STD-810G, Stryker OTM, Physical Characteristics	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		0.000		1.118	Feb 2020	-		1.118	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		0.100	Apr 2019	0.400	May 2020	-		0.400	Continuing	Continuing	0.000
AVCAD - DTE C - DT False (Positive) Alarm, Interoperability, Platform Integration	MIPR	Various : Various	0.000	0.000		0.000		0.790	Dec 2019	-		0.790	Continuing	Continuing	0.000
AVCAD - DTE C - DT Coastal Operational Service Life	MIPR	Naval Research Laboratory : Key West, FL	0.000	0.000		0.000		0.210	Apr 2020	-		0.210	Continuing	Continuing	0.000
AVCAD - DTE C - DT Explosive Atmosphere Test	MIPR	Electronic Proving Ground : Fort Huachuca, AZ	0.000	0.000		0.000		0.053	Feb 2020	-		0.053	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		0.000		0.053	Jan 2020	-		0.053	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AVCAD - DTE C - DT Shipboard Operation Verification	MIPR	Potomac Test Range : Potomac Mills, VA	0.000	0.000		0.000		0.315	Feb 2020	-		0.315	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 Center : Dahlgren, VA	0.000	0.000		0.000		0.053	Feb 2020	-		0.053	Continuing	Continuing	0.000
AVCAD - DTE C - DT Battlefield Contaminant/ Maintenance Demo	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.183	Feb 2020	-		0.183	Continuing	Continuing	0.000
AVCAD - DTE C - DT Electromagnetic Survivability	MIPR	White Sand Missile Range : Mesa, AZ	0.000	0.000		0.000		0.180	Feb 2020	-		0.180	Continuing	Continuing	0.000
AVCAD - DTE C - DT Fixed Wing Compatibility	MIPR	Edwards Air Force Base : Lancaster, CA	0.000	0.000		0.000		0.025	Feb 2020	-		0.025	Continuing	Continuing	0.000
MPCAD - DTE C - Various	MIPR	Various : Various	0.000	0.000		0.000		0.797	Feb 2020	-		0.797	Continuing	Continuing	0.000
MPCAD - DTE - DT Library Build and System Verification	MIPR	West Desert Test Center : Dugway, UT	0.000	0.000		4.289	Jan 2019	9.219	Feb 2020	-		9.219	Continuing	Continuing	0.000
MPCAD - DTE C - DT Interoperability	MIPR	Eglin AFB : Eglin Air Force Base, FL	0.000	0.000		0.000		0.400	Jan 2020	-		0.400	Continuing	Continuing	0.000
MPCAD - DTE C - DT Cyber Security Vulnerability	MIPR	Joint Interoperability Test Command (JITC) : Fort Huachuca, AZ	0.000	0.000		0.000		0.100	Feb 2020	-		0.100	Continuing	Continuing	0.000
MPCAD - DTE C - DT Explosive Atmosphere	MIPR	Electronic Proving Ground : Fort Huachuca, AZ	0.000	0.000		0.000		0.050	Feb 2020	-		0.050	Continuing	Continuing	0.000
MPCAD - DTE C - DT False (Positive) Alarm, DT Logistics Demonstration	MIPR	TBD : TBD	0.000	0.000		0.000		0.300	Feb 2020	-		0.300	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MPCAD - DTE C - DT Natural Desert Environmental Storage	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	0.000		0.000		0.100	Mar 2020	-		0.100	Continuing	Continuing	0.000
MPCAD - DTE C - DT Electromagnetic Survivability	MIPR	White Sand Missile Range : Mesa, AZ	0.000	0.000		0.000		0.400	Jan 2020	-		0.400	Continuing	Continuing	0.000
MPCAD - DTE C - OT Limited Users Test	MIPR	Operational Test Command (OTC) : Ft. Hood, TX	0.000	0.000		0.000		1.800	Jun 2020	-		1.800	Continuing	Continuing	0.000
PCAD - DTE C - PQT DT Customer Chamber Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		1.775	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE C - Referee equipment procurement	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.280	Dec 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
EMBD - DTE S - DT/OT Live Agent Aerosol Testing	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.000		1.000	Feb 2020	-		1.000	Continuing	Continuing	0.000
EMBD - DTE S - DT LOG DEMO	MIPR	20th Support Command : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.050	Feb 2020	-		0.050	Continuing	Continuing	0.000
EMBD - DTE C - DT/OT - OA/CVPA/RAM	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.000	0.000		0.000		0.720	Feb 2020	-		0.720	Continuing	Continuing	0.000
EMBD - OTE S - Operational Test & Evaluation & Adverserial Assessment	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.000		0.000		0.750	Feb 2020	-		0.750	Continuing	Continuing	0.000
EMBD - OTE S - DT - MIL-STD	MIPR	Aberdeen Test Center (ATC) :	0.000	0.000		0.000		0.250	Feb 2020	-		0.250	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Aberdeen Proving Ground, MD													
EMBD - DTE - Live Agent Testing	C/CPFF	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	0.323	Jul 2018	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	0.000		0.400	Jan 2019	0.600	Dec 2019	-		0.600	Continuing	Continuing	0.000
EMBD - DTE - DT Testing - False Alarm	MIPR	Various : Various	0.000	0.000		0.250	Feb 2019	0.350	Feb 2020	-		0.350	Continuing	Continuing	0.000
GBTI - Test and Evaluation of Technology Refresh Candidates	MIPR	Various : Various	0.059	1.284	Dec 2017	0.000	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - Developmental Testing	MIPR	Various : Various	3.131	2.040	Mar 2018	2.263	Jan 2019	0.675	Nov 2019	-		0.675	Continuing	Continuing	0.000
JBTDS - DTE - GSA WIBS Purchase	C/FFP	General Services Administration : Boston, MA	0.000	0.914	Aug 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - JHU-APL Special Projects	C/FFP	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	0.380	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - ARCA Chamber and Record Test Support	C/FFP	Battelle Memorial Institute : Columbus, OH	0.000	0.000		1.929	Nov 2019	0.850	Nov 2019	-		0.850	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		0.000		0.125	Nov 2019	-		0.125	Continuing	Continuing	0.000
JBTDS - DTE - Operational Assessment	MIPR	Various : Various	0.000	0.000		1.100	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBTDS - DTE - BPSA Test and Support	MIPR	Various : Various	0.000	2.642	Feb 2018	3.172	May 2019	0.000		-		0.000	Continuing	Continuing	0.000
JBTDS - DTE - BPSA and Other Test Events	C/FFP	Battelle Memorial Institute : Columbus, OH	0.000	3.066	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JHBI - OTHT S - JHBI Test and Evaluation	MIPR	Army Materiel Systems Analysis Activity : Aberdeen Proving Ground, MD	0.000	0.012	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JHBI - DTE S - Test and Evaluation Support	MIPR	Johns Hopkins University - Applied Physics Lab : Laurel, MD	0.000	0.203	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - DTE - Test and Evaluation	MIPR	Various : Various	0.000	1.174	Nov 2017	2.663	Nov 2018	7.470	Nov 2019	-		7.470	Continuing	Continuing	0.000
MMPRDS - DTE S - MMPRDS - Production Qualification Test	MIPR	White Sand Missile Range : Mesa, AZ	0.000	0.000		0.000	Apr 2019	2.359		-		2.359	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Capabilities Assessment	C/CPFF	MA Institute of Tech - Lincoln Labs (MIT-LL) : Lexington, MA	0.000	0.536	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Capability Assessments	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.602	Mar 2018	0.669	Dec 2018	0.700	Dec 2019	-		0.700	Continuing	Continuing	0.000
NTA DEFENSE - DTE S - Analysis and Evaluation	C/CPFF	Defense Logistics Agency : Philadelphia, PA	0.919	0.000		0.103	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
ROSETTA - DTE C - Development Testing	MIPR	Various : Various	0.000	0.000		0.387	Dec 2018	2.300	Oct 2019	-		2.300	Continuing	Continuing	0.000
		Subtotal	4.272	14.771		21.807		35.345		-		35.345	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGCD - PM/MS C - Program Management and Systems Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	9.968	6.086	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AVCAD - PM/MS C - Management Support	MIPR	Various : Various	0.000	0.000		2.065	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
MPCAD - PM/MS S - JPEO CBRN and JPM NBC CA Management Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		3.195	Nov 2018	5.189	Dec 2019	-		5.189	Continuing	Continuing	0.000
PCAD - PM/MS S - PCAD	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		1.293	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
EMBD - JPEO Program Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.878	Feb 2018	1.892	Feb 2019	1.659	Feb 2020	-		1.659	Continuing	Continuing	0.000
EMBD - JPM CA Program Support and Core Labor	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	2.200	0.400	Dec 2017	0.783	Oct 2018	0.735	Nov 2019	-		0.735	Continuing	Continuing	0.000
GBTI - PM/MS C - Program Management Support	Allot	JPM Guardian : Aberdeen Proving Ground, MD	0.970	0.885	Jan 2018	2.108	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
GBTI - PM/MS S - Network Analysis and Characterization	MIPR	Various : Various	0.216	1.406	Jun 2018	0.000	Jun 2019	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CA5 / *CONTAMINATION AVOIDANCE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBTDS - JPEO Program Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	10.466	3.751	Nov 2017	3.639	Nov 2018	1.808	Nov 2019	-		1.808	Continuing	Continuing	0.000
JBTDS - JPM CA Program Support & Core Labor	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	2.809	0.517	Aug 2018	1.320	Jan 2019	0.770	Jan 2020	-		0.770	Continuing	Continuing	0.000
JHBI - PM/MS S - Program Management Support	Various	Various : Various	0.000	0.159	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JNBCRS 1 - PM - Program Management and System Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	3.273	Nov 2017	2.425	Nov 2018	4.340	Nov 2019	-		4.340	Continuing	Continuing	0.000
MMPRDS - PM/MS C - MMPRDS Program Management Matrix	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.314	Nov 2018	1.060	Nov 2019	-		1.060	Continuing	Continuing	0.000
MMPRDS - PM/MS C - MMPRDS Program Management Support	MIPR	JPM Guardian : Aberdeen Proving Ground, MD	0.000	0.000		0.000	Nov 2018	1.521	Nov 2019	-		1.521	Continuing	Continuing	0.000
NTA DEFENSE - PM/MS S - IPT Support/Program Management	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	6.012	0.251	Dec 2017	0.177	Dec 2018	0.554	Dec 2019	-		0.554	Continuing	Continuing	0.000
ROSETTA - PM/MS C - Program Management and Systems Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO,	0.000	0.000		0.235	Dec 2018	0.564	Oct 2019	-		0.564	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Aberdeen Proving Ground, MD													
		Subtotal	32.641	17.606		19.446		18.200		-		18.200	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	104.062	95.134		111.781		131.985		-		131.985	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

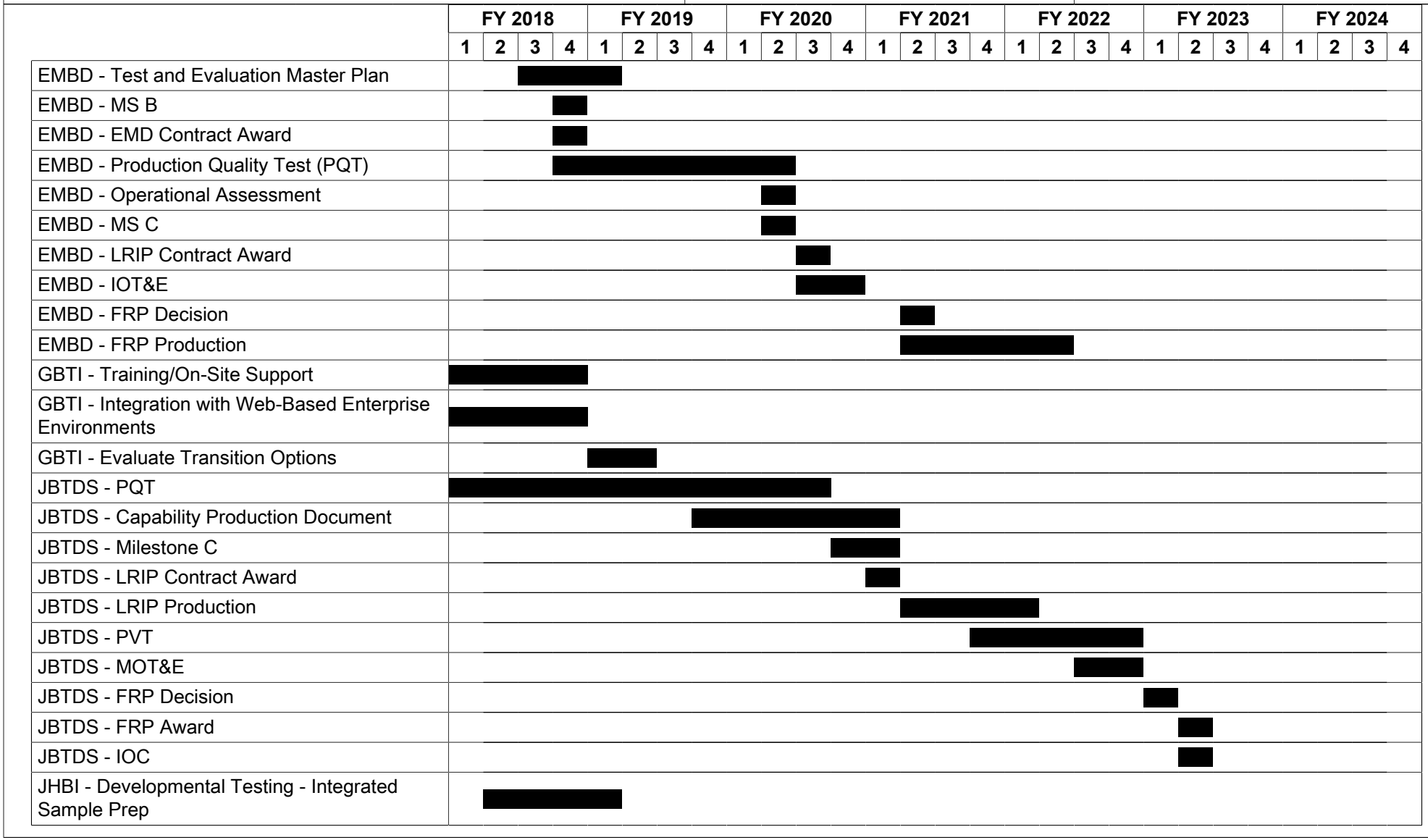

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

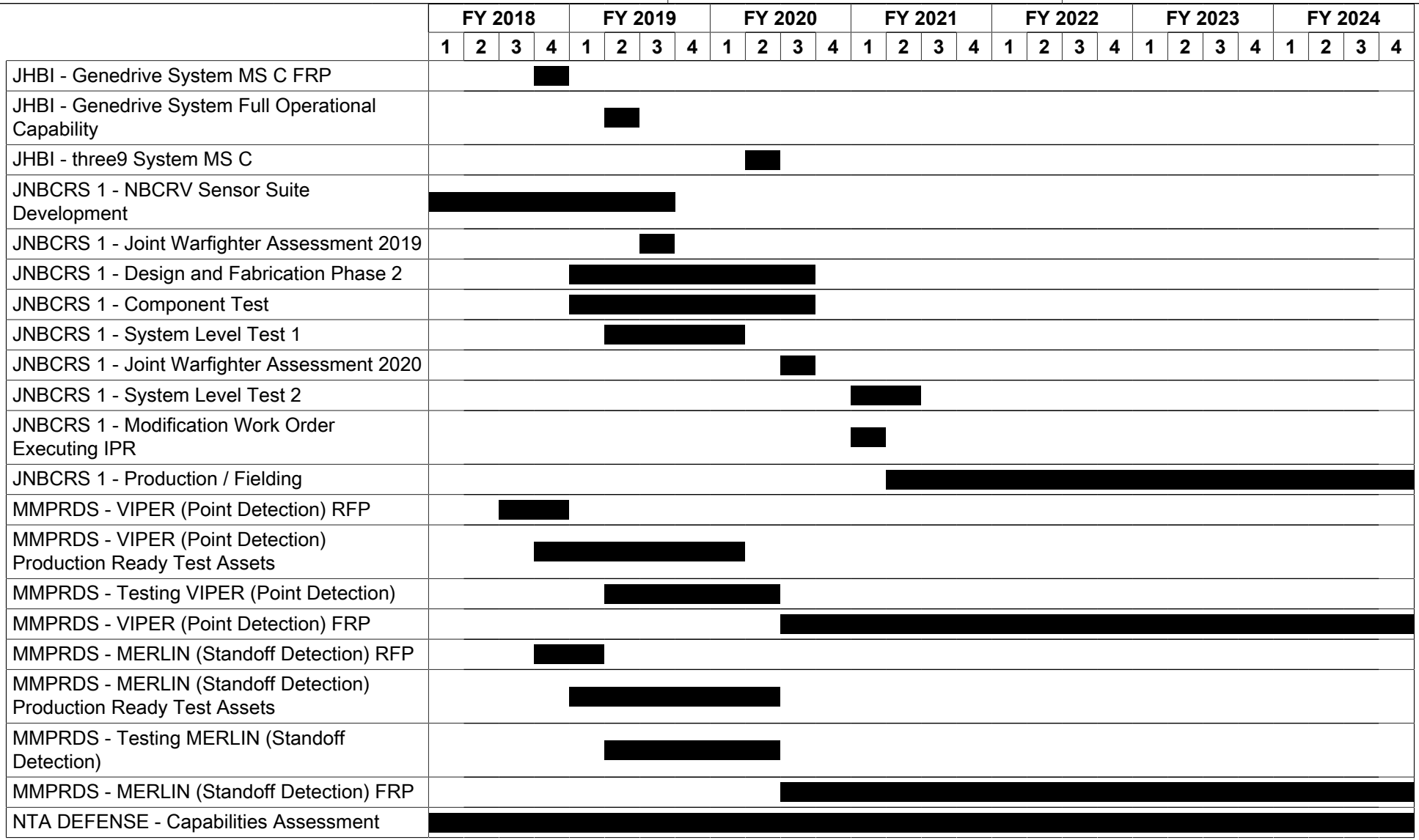

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

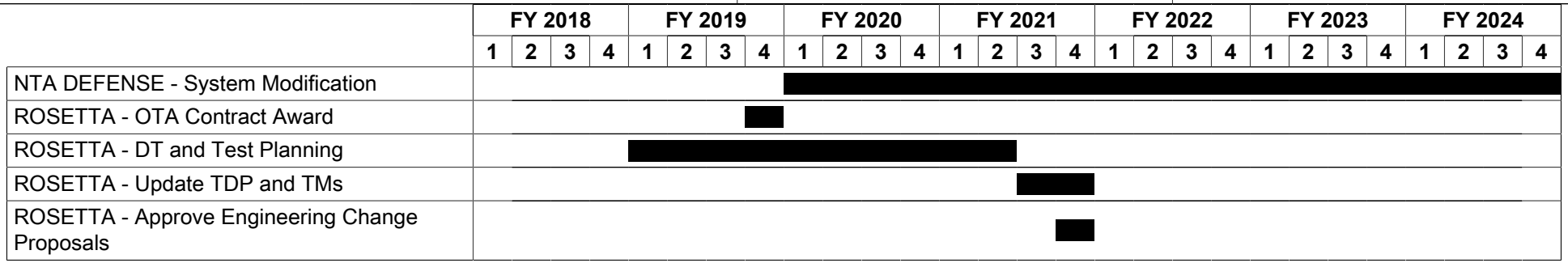

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
NGCD - Acceleration	1	2018	4	2018
NGCD - AVCAD - Milestone B	2	2018	2	2018
NGCD - AVCAD - EMD Contract	4	2018	3	2020
NGCD - AVCAD - Milestone C	2	2020	2	2020
NGCD - AVCAD - LRIP	3	2020	3	2021
NGCD - AVCAD - FRP Decision	4	2021	4	2021
NGCD - MPCAD - Milestone B	4	2018	4	2018
NGCD - MPCAD - EMD Contract	3	2018	1	2021
NGCD - MPCAD - Milestone C	2	2021	2	2021
NGCD - MPCAD - LRIP	3	2021	3	2023
NGCD - MPCAD - FRP	4	2023	4	2024
AVCAD - MS B (NGCD 1)	2	2018	2	2018
AVCAD - EMD Contract (NGCD 1)	4	2018	4	2021
AVCAD - MS C	4	2021	4	2021
AVCAD - LRIP	4	2021	1	2023
AVCAD - FRP Decision	1	2023	1	2023
MPCAD - MS B (NGCD 3)	4	2018	4	2018
MPCAD - EMD Contract (NGCD 3)	4	2018	3	2021
MPCAD - MS C	3	2021	3	2021
MPCAD - LRIP	4	2021	3	2023
MPCAD - FRP	4	2023	4	2024
PCAD - JCAD SLA Kit decision	1	2021	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EMBD - TEMP	1	2018	1	2019
EMBD - CPD	2	2018	1	2019
EMBD - Test and Evaluation Master Plan	3	2018	1	2019
EMBD - MS B	4	2018	4	2018
EMBD - EMD Contract Award	4	2018	4	2018
EMBD - Production Quality Test (PQT)	4	2018	2	2020
EMBD - Operational Assessment	2	2020	2	2020
EMBD - MS C	2	2020	2	2020
EMBD - LRIP Contract Award	3	2020	3	2020
EMBD - IOT&E	3	2020	4	2020
EMBD - FRP Decision	2	2021	2	2021
EMBD - FRP Production	2	2021	2	2022
GBTI - Training/On-Site Support	1	2018	4	2018
GBTI - Integration with Web-Based Enterprise Environments	1	2018	4	2018
GBTI - Evaluate Transition Options	1	2019	2	2019
JBTDS - PQT	1	2018	3	2020
JBTDS - Capability Production Document	4	2019	1	2021
JBTDS - Milestone C	4	2020	1	2021
JBTDS - LRIP Contract Award	1	2021	1	2021
JBTDS - LRIP Production	2	2021	1	2022
JBTDS - PVT	4	2021	4	2022
JBTDS - MOT&E	3	2022	4	2022
JBTDS - FRP Decision	1	2023	1	2023
JBTDS - FRP Award	2	2023	2	2023
JBTDS - IOC	2	2023	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JHBI - Developmental Testing - Integrated Sample Prep	2	2018	1	2019
JHBI - Genedrive System MS C FRP	4	2018	4	2018
JHBI - Genedrive System Full Operational Capability	2	2019	2	2019
JHBI - three9 System MS C	2	2020	2	2020
JNBCRS 1 - NBCRV Sensor Suite Development	1	2018	3	2019
JNBCRS 1 - Joint Warfighter Assessment 2019	3	2019	3	2019
JNBCRS 1 - Design and Fabrication Phase 2	1	2019	3	2020
JNBCRS 1 - Component Test	1	2019	3	2020
JNBCRS 1 - System Level Test 1	2	2019	1	2020
JNBCRS 1 - Joint Warfighter Assessment 2020	3	2020	3	2020
JNBCRS 1 - System Level Test 2	1	2021	2	2021
JNBCRS 1 - Modification Work Order Executing IPR	1	2021	1	2021
JNBCRS 1 - Production / Fielding	2	2021	4	2024
MMPRDS - VIPER (Point Detection) RFP	3	2018	4	2018
MMPRDS - VIPER (Point Detection) Production Ready Test Assets	4	2018	1	2020
MMPRDS - Testing VIPER (Point Detection)	2	2019	2	2020
MMPRDS - VIPER (Point Detection) FRP	3	2020	4	2024
MMPRDS - MERLIN (Standoff Detection) RFP	4	2018	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	2024
NTA DEFENSE - Capabilities Assessment	1	2018	4	2024
NTA DEFENSE - System Modification	1	2020	4	2024
ROSETTA - OTA Contract Award	4	2019	4	2019
ROSETTA - DT and Test Planning	1	2019	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CA5 / *CONTAMINATION AVOIDANCE (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ROSETTA - Update TDP and TMs	3	2021	4	2021
ROSETTA - Approve Engineering Change Proposals	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CM5 / *HOMELAND DEFENSE (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CM5: *HOMELAND DEFENSE (EMD)*	-	15.513	6.000	12.646	-	12.646	0.000	0.000	0.000	0.000	0.000	34.159
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). The TV-IS is currently in the EMD phase, with proto-types built and testing that begins in February 2019 and concludes in FY2020.

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.

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 2018	FY 2019	FY 2020
Title: 1) CALS	15.513	6.000	12.646
Description: 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.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CM5 / *HOMELAND DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue engineering changes and refurbishment of variant prototypes ensuring integration and connectivity between modules. Completed System Level Testing and engineering changes / refurbishment of variant prototypes ensuring integration and connectivity between modules. Continue the pursuit of safety release for TV IS in preparation for Logistics Demonstration. ***FY 2020 Plans:*** Complete Logistics and User Demonstrations, Quantification, Humidity and Decontamination developmental tests to include other government agency support and oversight for the theater validation variant. Continue the pursuit of safety release for TV IS in preparation for Logistics Demonstration. Develop NGDS food and water assay panel associated with Bio Detection capability to include sample processing protocols. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	15.513	6.000	12.646

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JS0005: *COMMON ANALYTICAL LABORATORY SYSTEM (CALS)*	13.964	48.317	4.293	-	4.293	56.581	69.741	69.481	69.475	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 Non-traditional agent materials in environmental samples technology. 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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CM5 / *HOMELAND DEFENSE (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALS - HW S Prototype System Manufacturing	C/CPIF	Battelle Memorial Institute : Columbus, OH	29.472	4.079	Dec 2017	2.568	Nov 2018	0.000		-		0.000	0.000	36.119	0.000
CALS - HW S - NGDS Tactical Variant Alpha Prototype	C/CPFF	BioFire Dx : Salt Lake City, UT	1.501	0.354	Mar 2018	0.000		2.083	Nov 2019	-		2.083	0.000	3.938	0.000
		Subtotal	30.973	4.433		2.568		2.083		-		2.083	0.000	40.057	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALS - ES S - Engineering Support System	C/FFP	Various : Various	9.921	3.308	Feb 2018	0.000		1.822	Feb 2020	-		1.822	0.000	15.051	0.000
CALS - ES C - Other Government Agencies Services	MIPR	Various : Various	0.000	0.946	Jan 2018	0.237	Jan 2019	1.347	Jan 2020	-		1.347	0.000	2.530	0.000
CALS - ES S - System Integration Laboratory Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.336	0.642	Jan 2018	0.000		0.000		-		0.000	0.000	1.978	0.000
CALS - TD/D S - Safety Internal Review Board	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.182	0.100	Mar 2018	0.100	Mar 2019	0.100	Mar 2020	-		0.100	0.000	0.482	0.000
		Subtotal	11.439	4.996		0.337		3.269		-		3.269	0.000	20.041	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CM5 / *HOMELAND DEFENSE (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALS - DTE S - DT/OT and LOGDEMO	C/CPIF	Battelle Memorial Institute : Columbus, OH	0.000	1.267	Jan 2018	0.000		0.000		-		0.000	0.000	1.267	0.000
CALS - DTE C - Other Government Agencies (Test Support)	MIPR	Various : Various	0.000	0.000		0.000		2.361	Jan 2020	-		2.361	0.000	2.361	0.000
CALS - DTE C - BMI Test Support	C/CPIF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.150	Jan 2019	0.802	Dec 2019	-		0.802	0.000	0.952	0.000
CALS - DTE S - System DT/OT and LOGDEMO	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	3.182	1.818	Jan 2018	1.100	Jul 2019	0.000		-		0.000	0.000	6.100	0.000
CALS - OTHT C - Operation Test Agencies	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	0.150	1.977	Jan 2018	0.200	Feb 2019	1.808	Dec 2019	-		1.808	0.000	4.135	0.000
		Subtotal	3.332	5.062		1.450		4.971		-		4.971	0.000	14.815	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CALS - PM/MS HW - Program Office - Planning and Programming	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	7.888	1.022	Jan 2018	1.645	Nov 2018	2.323	Nov 2019	-		2.323	0.000	12.878	0.000
		Subtotal	7.888	1.022		1.645		2.323		-		2.323	0.000	12.878	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.632	15.513		6.000		12.646		-		12.646	0.000	87.791	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CM5 / *HOMELAND DEFENSE (EMD)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CM5 / *HOMELAND DEFENSE (EMD)*

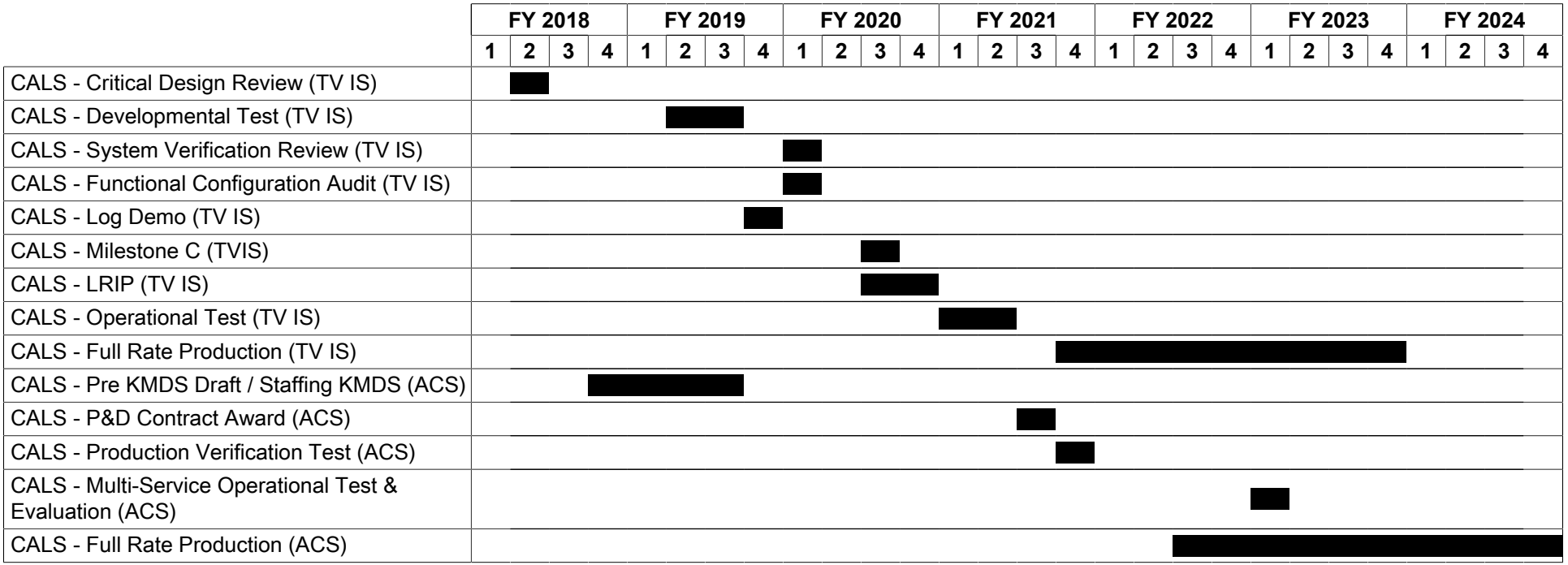

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CM5 / *HOMELAND DEFENSE (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CALS - Critical Design Review (TV IS)	2	2018	2	2018
CALS - Developmental Test (TV IS)	2	2019	3	2019
CALS - System Verification Review (TV IS)	1	2020	1	2020
CALS - Functional Configuration Audit (TV IS)	1	2020	1	2020
CALS - Log Demo (TV IS)	4	2019	4	2019
CALS - Milestone C (TVIS)	3	2020	3	2020
CALS - LRIP (TV IS)	3	2020	4	2020
CALS - Operational Test (TV IS)	1	2021	2	2021
CALS - Full Rate Production (TV IS)	4	2021	4	2023
CALS - Pre KMDS Draft / Staffing KMDS (ACS)	4	2018	3	2019
CALS - P&D Contract Award (ACS)	3	2021	3	2021
CALS - Production Verification Test (ACS)	4	2021	4	2021
CALS - Multi-Service Operational Test & Evaluation (ACS)	1	2023	1	2023
CALS - Full Rate Production (ACS)	3	2022	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CO5 / *COLLECTIVE PROTECTION (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CO5: *COLLECTIVE PROTECTION (EMD)*	-	8.833	11.307	7.322	-	7.322	6.918	1.497	0.000	0.000	0.000	35.877
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.

The systems included in this project are:
(1) Chemical-Biological Aircraft Survivability Barrier (CASB)
(2) Joint Expeditionary Collective Protection (JECP) Family of Systems, to include Collective Protection Filters a Congressional add.

The CASB will provide a lightweight, low-cost, expendable, negative-pressure enclosure that will protect the interior of multi-service aircraft (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 need for extensive decontamination. CASB will field a capability that will support the overall intent of the (Aircraft CBRN Contamination Survivability ACCS) Initial Capabilities Development (ICD) in the areas of barriers, aircraft containment systems, modular Collective Protection (ColPro) for aircraft interiors, and disposable ColPro. CASB is one member of a family of systems that will support the ICD. It will protect the interior of DoD airlift assets (MH-47, CV-22, and MC-130s) from incidental cross-contamination by CB-contaminated personnel and equipment and cargos under transport.

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

Congressional Interest Item -The Collective Protection Filters for Gas-Phase Contaminants project will develop and test innovative filters which do not require any adjustments to an existing heating, ventilation, and air conditioning (HVAC) unit to provide a level of chemical protection. The development of a prototype filter will be used in retrofitting buildings to enhance protection capabilities while reducing the installation costs. The Mobile Platform Collective Protection Filter Design Modernization project will develop and test a new filter system design that will reduce the number of filters in the mobile collective protection portfolio from 4 to 1, provide a universal air handling system for all mobile platforms, and use modern materials and manufacturing techniques to update 1950s era designs.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Chemical and Biological Aircraft Survivability Barrier (CASB) ***Description:*** Initiated developmental testing ***FY 2019 Plans:*** Complete Developmental Test and Evaluation (DT&E), conduct an Operational Assessment (OA), and complete operational test and evaluation needed to support Airworthiness (AWR) Certification. ***FY 2020 Plans:*** Complete testing and prepare all required documentation in support of MS C. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	1.470	3.335	0.877
Title: 2) Chemical Biological Aircraft Survivability Barrier (CASB) ***Description:*** CASB Prototype Development	1.280	-	-
Title: 3) JECP - Joint Expeditionary Collective Protection ***Description:*** Preparations for Phase 1 FRP Decision and Type Classification/Materiel Release (TC/MR).	1.167	-	-
Title: 4) JECP - Joint Expeditionary Collective Protection ***Description:*** Phase 2 system development and demonstration events. ***FY 2019 Plans:*** Initiate design and development of Phase 2 tent kits to address emerging service requirements for collective protection to new host platforms. Conduct Design Review, initiate prototyping for Low Rate Initial Production (LRIP) test articles, changes to logistic support products, and updates to the Government owned Technical Data Package. Begin test planning and initiate developmental testing. Manufacture Phase 2 LRIP test articles for Government developmental testing. (Tent Kit Single Skin, Qty 2 @ ~ unit cost $195K, Tent Kit 1, Qty 3 @ ~unit cost $180K, Tent Kit 3, Qty 1 ~ unit cost $205K, Structure Kit Unimproved, Qty 2 @ ~ unit cost $80K). ***FY 2020 Plans:*** 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. (Tent Kit Single Skin, Qty 4 @ unit cost $195K, Tent Kit 1, Qty 3 @ unit cost $180K, Tent Kit 3, Qty 1 unit cost $205K, Structure Kit Unimproved, Qty 4 @ unit cost $80K). Conduct manufacturing readiness and production readiness assessments. Complete	2.916	5.972	6.445

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Government developmental testing and begin detailed planning for Multi- Operational Test and Evaluation event and Technical Manual Verification. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 5) Prototype Filtration Systems Development (Congressional Interest Item) ***Description:*** Filtration System Development & Reviews ***FY 2019 Plans:*** Draft Statement of Objectives for projects to conduct reviews on filtration requirements and review existing collective protection system parameters, develop prototype filtration systems, test filtration systems and deliver reports on requirements, prototypes and testing results for the Collective Protection Filters for Gas-Phase Contaminants project and the Mobile Platform Collective Protection Filter Design Modernization project. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is entering completion and all activities will be closed.	2.000	2.000	-
Accomplishments/Planned Programs Subtotals	8.833	11.307	7.322

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JP1111: *JOINT EXPEDITIONARY COLLECTIVE PROTECTION (JECP)*	9.607	22.752	13.570	-	13.570	20.182	24.238	32.625	39.196	Continuing	Continuing

Remarks

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 in a negative pressure system specifically designed for airframe use. CASB will review existing materials and technology as well as designs, configurations, and test data from legacy systems developed for ColPro applications. Using this information, systems will be developed to meet the broader range of airframes and airframe specific requirements, chemical biological protection and logistic supportability that are now required. Based on commonality between the requirements of the CASB and the requirements of similar programs (i.e. Joint Expeditionary Collective Protection, TIS, and Aeromedical Biological

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

Containment System), CASB will be initiated at MS B EMD phase to meet these expanded requirements within the various airframes. CASB will leverage an IDIQ contract to pursue a Commercial-of-the-Shelf (COTS) development strategy using full and open competition for awards following MS B and MS C. During the EMD phase, CASB intends to award a Cost Plus Incentive Fee (CPIF) delivery order for the development and delivery of prototypes for airworthiness certification within two years. During the Production phase, CASB intends to pursue a Fixed Price Incentive Fee (FPIF) delivery order to reduce the logistical burden and sustainment costs.

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 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 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 under the Joint Enterprise Research, Development, Acquisition, and Production (JE-RDAP) Contract will be awarded to 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 JE-RDAP competitive delivery order 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 interface types for use with collective protection. These efforts involve a simplified acquisition procurement contract and exploitation of commercial off-the-shelf items.

CONGRESSIONAL INTEREST ITEMS

CONGRESSIONAL INTEREST ITEM #229
FILTRATION - COLLECTIVE PROTECTION FILTERS FOR GAS-PHASE CONTAMINANTS: The Collective Protection Filters for Gas-Phase Contaminants project will use the Combatting Weapons of Mass Destruction Other Transaction Authority to award filtration development work to a single vendor. The vendor will work in conjunction with the Army Corps of Engineers and the Edgewood Chemical and Biological Center to develop specifications used for future competitive procurements of filters developed under the project. The Mobile Collective Protection Filter Design Modernization Project will utilize the Combatting Weapons of Mass Destruction Other Transaction Authority to develop designs and construct prototypes for testing and evaluation to a single vendor. A specification will be developed as a result of the project to support competitive follow-on procurements through the Joint Enterprise Research, Development, Acquisition, and Production contract.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CASB - HW S - Prototype Development, TRA, MRA	C/FFP	Integrated Solutions for Systems (IS4S) : Huntsville, AL	0.000	1.279	Apr 2018	0.160	Dec 2018	0.000		-		0.000	0.000	1.439	0.000
JECP - HW S - Phase 2 System Product Development	C/FPIF	TBD : TBD	0.000	0.845	Dec 2018	0.764	Jan 2019	0.745	Jan 2020	-		0.745	0.000	2.354	0.000
JECP - HW S - Phase 2 Prototype Manufacturing	C/FPIF	TBD : TBD	0.000	0.000		1.295	Jan 2019	1.845	Jan 2020	-		1.845	0.000	3.140	0.000
JECP - HW S - Non-recurring Engineering	C/FPIF	Leidos : Abingdon, MD	5.970	0.147	Feb 2018	0.000		0.000		-		0.000	0.000	6.117	0.000
CONG - HW C - Hardware and Support Equipment for Collective Protection Filtration Systems	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.600	Jun 2018	1.500	Dec 2018	0.000		-		0.000	0.000	3.100	0.000
		Subtotal	5.970	3.871		3.719		2.590		-		2.590	0.000	16.150	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CASB - ES S - IPT and Technical Support	MIPR	Various : Various	0.000	0.584	Nov 2017	0.687	Nov 2018	0.252	Nov 2019	-		0.252	0.000	1.523	0.000
JECP - ES S - Systems Engineering Oversight	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	1.446	0.590	Oct 2017	0.221	Dec 2018	0.526	Nov 2019	-		0.526	0.000	2.783	0.000
JECP - ES S - Systems Engineering IPT	MIPR	Various : Various	7.265	0.606	Oct 2017	0.103	Dec 2018	0.103	Nov 2019	-		0.103	0.000	8.077	0.000
JECP - ILS S - Integrated Logistics IPT	MIPR	Various : Various	6.745	0.715	Oct 2017	0.609	Dec 2018	0.609	Nov 2019	-		0.609	0.000	8.678	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) CO5 / *COLLECTIVE PROTECTION (EMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CONG - ES S - Engineering and IPT Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.300	Jun 2018	0.300	Dec 2018	0.000		-		0.000	0.000	0.600	0.000
		Subtotal	15.456	2.795		1.920		1.490		-		1.490	0.000	21.661	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CASB - OTE S - Operational Testing	MIPR	National Assessment Group : Kirkland, NM	0.000	0.000		0.650	Apr 2019	0.520	Apr 2020	-		0.520	0.000	1.170	0.000
CASB - DTE S - Developmental Testing	MIPR	Various : Various	0.000	0.552	Jul 2018	1.145	Nov 2018	0.000		-		0.000	0.000	1.697	0.000
JECP - OTHT SB - Test & Evaluation IPT	MIPR	Various : Various	7.616	0.223	Dec 2017	0.359	Dec 2018	0.359	Nov 2019	-		0.359	0.000	8.557	0.000
JECP - DTE S - Phase 2 Systems Developmental Testing	MIPR	Various : Various	0.000	0.000		1.186	Dec 2018	0.950	Nov 2019	-		0.950	0.000	2.136	0.000
CONG - DTE S - Developmental Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.100	Aug 2018	0.200	Dec 2018	0.000		-		0.000	0.000	0.300	0.000
		Subtotal	7.616	0.875		3.540		1.829		-		1.829	0.000	13.860	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CASB - PM/MS S - Program Management Support	MIPR	Various : Various	0.000	0.335	Nov 2017	0.693	Nov 2018	0.105	Nov 2019	-		0.105	0.000	1.133	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JECP - PM/MS S - Program Management Support	MIPR	Various : Various	10.863	0.957	Nov 2017	1.435	Dec 2018	1.308	Nov 2019	-		1.308	0.000	14.563	0.000
		Subtotal	10.863	1.292		2.128		1.413		-		1.413	0.000	15.696	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.905	8.833		11.307		7.322		-		7.322	0.000	67.367	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

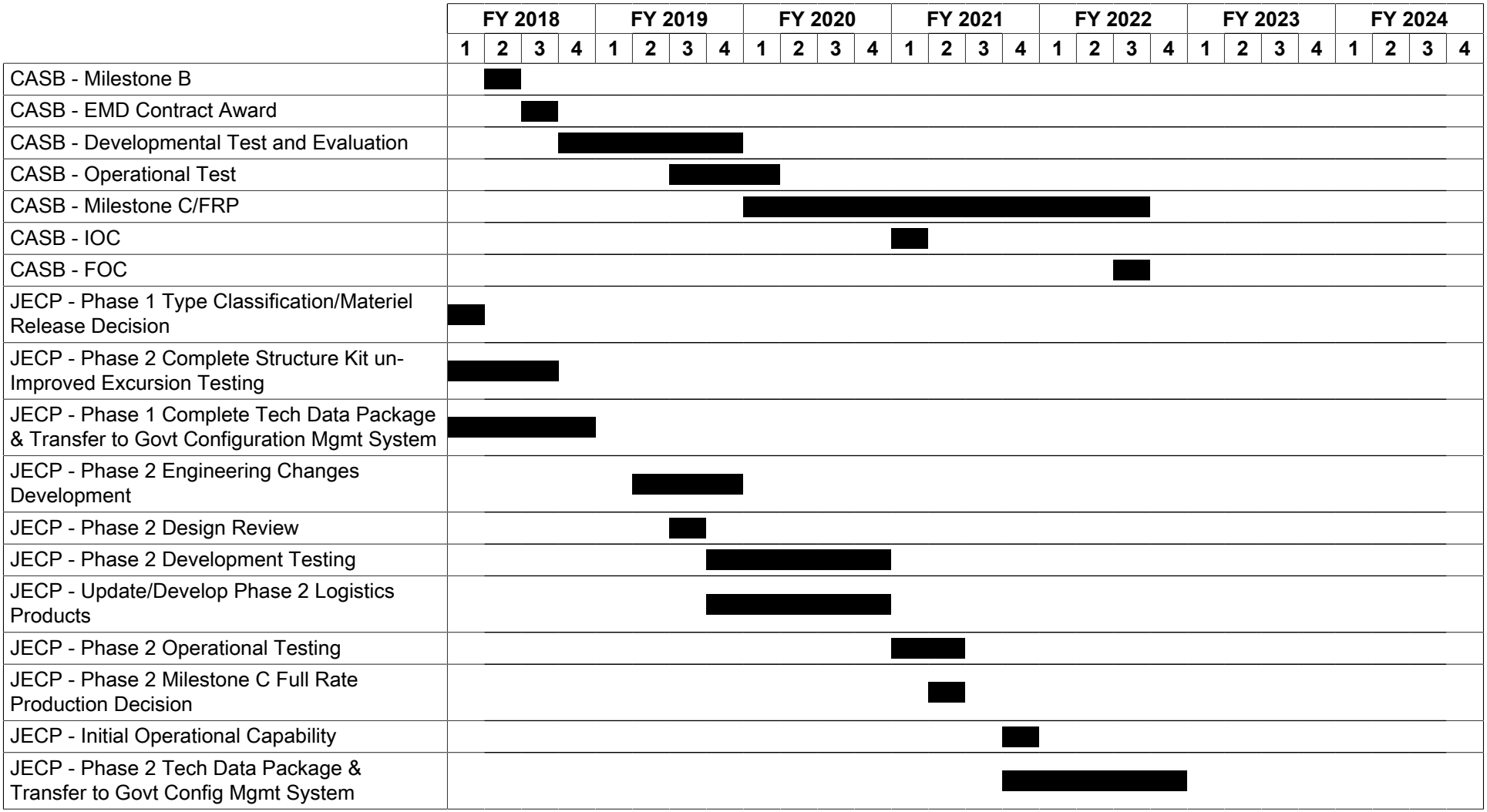

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

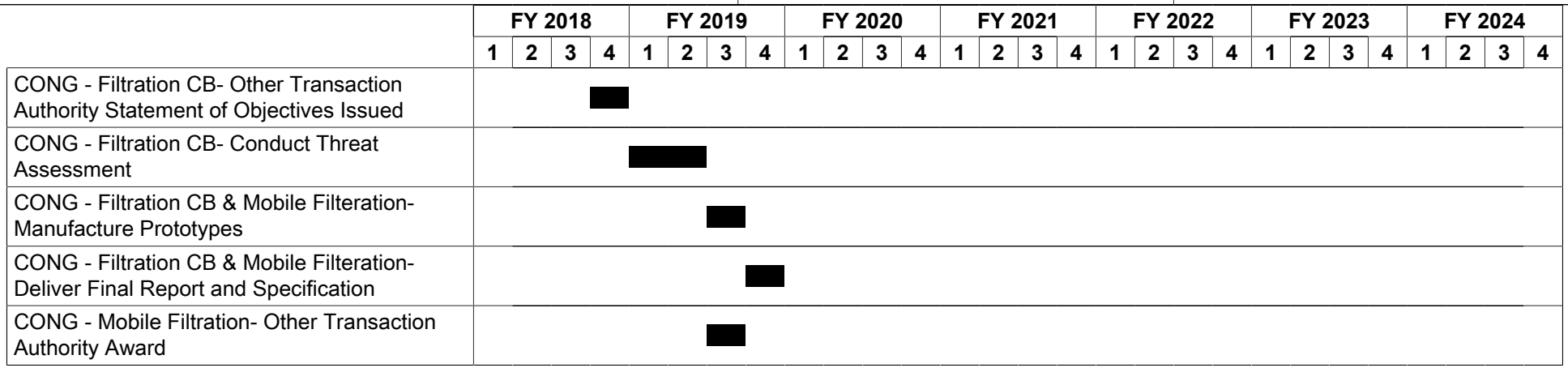

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CASB - Milestone B	2	2018	2	2018
CASB - EMD Contract Award	3	2018	3	2018
CASB - Developmental Test and Evaluation	4	2018	4	2019
CASB - Operational Test	3	2019	1	2020
CASB - Milestone C/FRP	1	2020	3	2022
CASB - IOC	1	2021	1	2021
CASB - FOC	3	2022	3	2022
JECP - Phase 1 Type Classification/Materiel Release Decision	1	2018	1	2018
JECP - Phase 2 Complete Structure Kit un-Improved Excursion Testing	1	2018	3	2018
JECP - Phase 1 Complete Tech Data Package & Transfer to Govt Configuration Mgmt System	1	2018	4	2018
JECP - Phase 2 Engineering Changes Development	2	2019	4	2019
JECP - Phase 2 Design Review	3	2019	3	2019
JECP - Phase 2 Development Testing	4	2019	4	2020
JECP - Update/Develop Phase 2 Logistics Products	4	2019	4	2020
JECP - Phase 2 Operational Testing	1	2021	2	2021
JECP - Phase 2 Milestone C Full Rate Production Decision	2	2021	2	2021
JECP - Initial Operational Capability	4	2021	4	2021
JECP - Phase 2 Tech Data Package & Transfer to Govt Config Mgmt System	4	2021	4	2022
CONG - Filtration CB- Other Transaction Authority Statement of Objectives Issued	4	2018	4	2018
CONG - Filtration CB- Conduct Threat Assessment	1	2019	2	2019
CONG - Filtration CB & Mobile Filteration- Manufacture Prototypes	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** CO5 / *COLLECTIVE PROTECTION (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CONG - Filtration CB & Mobile Filteration- Deliver Final Report and Specification	4	2019	4	2019
CONG - Mobile Filtration- Other Transaction Authority Award	3	2019	3	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
DE5: *DECONTAMINATION SYSTEMS (EMD)*	-	10.162	14.049	8.267	-	8.267	10.260	11.094	19.285	17.769	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

Efforts included in this Project are:
(1) Contaminated Human Remains System (CHRS)
(2) Major Defense Acquisition Program (MDAP)
(3) Decontamination Family of Systems (DFoS) Contamination Indicator Decontamination Assurance System (CIDAS)
(4) DFoS General Purpose Decontaminant (GPD)
(5) Joint Biological Agent Decontamination System (JBADS).

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

DFoS CIDAS is a contamination indicator/decontamination assurance technology. It will consist of an indicator and an applicator, for which there will be three applicator configurations (small-scale, tactical large scale, and reusable large scale applicators) and three indicator formulations (nerve training, nerve and blister indicators). The indicator will be sprayed on tactical vehicles, aircraft, ships, crew-served weapons, and individual weapons that may have been exposed to traditional and non-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

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.

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

The 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, etc.), environmental control and monitoring system(s), and other ancillary components required to ensure efficacious biological agent decontamination. It will provide the capability to decontaminate biologically contaminated aircraft to safe levels and allow more rapid return to service. Future capability may address biological decontamination of vehicles and additional aircraft.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) CHRS	-	-	2.118
Description: Contaminated Human Remains Transfer Case (CHRT) Development and Support ***FY 2020 Plans:*** Complete Operational Test Agency Evaluation Report (OER), Technology and Manufacturing Readiness Assessments and Physical Configuration Audit. Update Technical Manuals, Life Cycle Sustainment Plan and other documentation in preparation for Milestone C/Full Rate Production decision. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.			
Title: 2) MDAP	0.157	1.125	1.035
Description: CBRN Survivability support ***FY 2019 Plans:*** Conduct CBRN survivability compliance reviews for Armored Multi-Purpose Vehicle, Combat Rescue Helicopter, Huey Replacement Program, Large Executive Aircraft Recapitalization, Littoral Combat Ship Fast Frigate, European Reassurance Initiative CBRN equipment, in preparation for various program acquisition milestones, system and sub-system test events, design reviews and low rate initial production reviews. ***FY 2020 Plans:*** Continue to ensure CBR survivability requirements are met for MDAP's by reviewing compliance documents, cross walking documented CBR survivability requirements listed in requirements documents with program execution plans, attending meetings to address integration needs and present CBR system and hardware options. Provide subject matter expertise in the execution of			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
CBR survivability requirements for both material solutions and non-material solutions. Review and assist in document preparation for milestones and programs reviews. Conducting CBRN survivability compliance reviews for Littoral Combat Ship. Supporting CBRN requirements for, Armored Multi-Purpose Vehicle, Combat Rescue Helicopter, European Reassurance Initiative CBRN equipment, CBR survivability system integration in preparation for various program acquisition milestones, system and sub-system test events, design reviews and low rate initial production reviews. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) DFoS CIDAS ***Description:*** Small Scale Applicators (SSA) - Nerve Indicator Kit ***FY 2019 Plans:*** Prepare for Material Release and Full Rate Production (FRP) Decision for Small Scale Applicators - Nerve Indicator kits. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	3.842	0.100	-
Title: 4) DFoS CIDAS ***Description:*** Small Scale Applicators (SSA) - Blister Indicator Kit ***FY 2019 Plans:*** Procure 100 Small Scale Applicator - Blister Indicator Kits ($347.97 ea.) for developmental testing (DT). Begin DT and prepare for System Verification Review (SVR) of blister indicator. Work to reduce the sustainment unit cost of the blister indicator through qualifying alternate sources of raw materials and changing manufacturing processes to increase efficiencies. ***FY 2020 Plans:*** Procure 62 Small Scale Applicator - Blister indicator kits ($347.97 ea.) for DT and associated Contract Data Requirements Lists (CDRLs) for Contractor's Progress, Status and Management Report, Program Schedule, etc. Complete DT to include level of indication (LOI) testing, material, industrial plant equipment, and detector compatibility, and shelf-life testing to prepare for production decision and fielding. Conduct technical reviews to include SVR, Functional Configuration Audit, and Environment, Safety, Occupational, Health (ESOH) analysis. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	-	1.922	4.514
Title: 5) DFoS CIDAS	2.769	2.735	0.378

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Large Scale Applicators (Nerve and Blister kits) ***FY 2019 Plans:*** Award option on nerve indicator contract to procure 150 Large Scale Applicator (LSA) Nerve Kits ($1170.61 ea.), 150 Large Scale Training Kits ($536.29 ea.) as Operational Test articles and associated CDRLS for the Large Scale Applicator (LSAs) Initial Operational Test & Evaluation (IOT&E). Procure 75 Large Scale Applicator - Blister Indicator kits ($3,488.68 ea.) for DT. Conduct testing on LSAs to include Reliability, Availability and Maintainability (RAM) and LOI testing. ***FY 2020 Plans:*** Procure 50 Large Scale Applicator - Blister Indicator kits ($3,488.68 ea.) for DT and associated CDRLs. Conduct DT and prepare for LSA production decision and fielding. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 6) DFoS GPD ***Description:*** DFoS GPD Support	0.545	-	-
Title: 7) JBADS ***Description:*** JBADS Development and Testing ***FY 2019 Plans:*** Award the JBADS Delivery Order. Procure 2 Aircraft Decontamination Units, control module, and scaled down Aircraft Enclosure at a cost of $2.2M. Initiate Contractor Specification Testing. Conduct/complete MIL-STD 810-G testing on the test articles. ***FY 2020 Plans:*** Complete Contractor Specification Testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	2.849	8.167	0.222
Accomplishments/Planned Programs Subtotals	10.162	14.049	8.267

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JD0050: *DECONTAMINATION FAMILY OF SYSTEMS (DFoS)*	3.447	13.035	17.050	-	17.050	10.851	9.063	11.692	16.815	Continuing	Continuing

Remarks

D. Acquisition Strategy

CONTAMINATED HUMAN REMAINS SYSTEM (CHRS)

The CHRS Program will leverage existing efforts under a Joint Urgent Operational Needs Statement which has accelerated the CHRT project. Additional minor design modifications, developmental and operational testing is planned as part of the overall acquisition strategy. Product development will consist of the design and prototyping of a CHRT. The contracting strategy will make use of The Combatting Weapons of Mass Destruction (CWMD) Other Transaction Agreement (OTA) to procure prototype units, followed by Developmental Testing (DT).

Following DT completion, an Operational Test Agency Assessment report will be prepared and an In Process Review will be conducted to determine readiness to proceed to production and Operational Testing. A Logistics Demonstration and Operational Testing will be conducted. An Operational Test Agency Evaluation Report will be written, and technical reviews will be conducted, in preparation for a Milestone C/Full Rate Production decision.

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.

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, the program office collaborated with external efforts, including the Hazard Mitigation, Materiel and Equipment Restoration (HaMMER) Advanced Technology Development Operational Demonstration and Extended User Evaluations, and conducted technology demonstrations on candidate indicator and applicator technologies to mitigate risk and identify affordable mature technologies that meet requirements. 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, 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 DFoS CIDAS program will award a sole source, performance based indefinite

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

delivery indefinite quantity contract for a blister technology. The program will integrate the Contractor and Government designed indicator and applicators and conduct developmental and operational testing.

DFoS GENERAL PURPOSE DECONTAMINANT (DFoS GPD)

Due to the maturity levels of the systems entering the Technology Development (TD) phase, the Milestone Decision Authority (MDA) issued an Acquisition Decision Memorandum (ADM) which approved DFoS GPD to by-pass Milestone (MS) B and enter directly to MS C Low Rate Initial Production (LRIP). During the TD Phase, the DFoS GPD Program employed a Competitive Prototyping (CP) effort to facilitate the evaluation of Commercial Off The Shelf (COTS) technologies releasing a Request for Proposal (RFP) as a combined synopsis/solicitation for commercial and Non-Developmental Items (NDI), utilizing full and open competition. As the DFoS GPD Program entered the final phase of Technology Development (Developmental Test), the program continued to follow an evolutionary acquisition strategy. Following the MS C/LRIP decision, the program acquired the technical data package rights to DFoS GPD and is in the process of establishing an organic production line at Pine Bluff Arsenal (PBA) to produce DFoS GPD to meet production quantities.

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. The EMD is supported by a Technology Readiness Assessment of 7 from the JCTD. 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. In FY20 procurement, JBADS is purchasing 1 system for Production Verification Testing (PVT), modification/ refurbishment, and fielding activities through FY22.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DFoS CIDAS - HW S - SSA - Nerve	C/FPIF	FLIR Detection : Inc, Stillwater, OK	4.766	0.981	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - HW S - SSA - Blister	SS/FPIF	FLIR Detection : Inc, Stillwater, OK	0.000	0.000		0.496	Dec 2018	0.500	Nov 2019	-		0.500	Continuing	Continuing	0.000
DFoS CIDAS - HW S - Large Scale Applicators (Nerve and Blister)	MIPR	Various : Various	1.925	0.707	Nov 2017	0.467	Dec 2018	0.110	Nov 2019	-		0.110	Continuing	Continuing	0.000
JBADS - HW C - Aircraft Decontamination Units and scaled-down Aircraft Enclosure for MIL-STD 810-G Testing	C/CPIF	TBD : TBD	0.000	0.000		2.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	6.691	1.688		3.163		0.610		-		0.610	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - TD/D S - IPT and Technical Support	MIPR	Various : Various	0.000	0.000		0.000		0.976	Nov 2019	-		0.976	Continuing	Continuing	0.000
CHRS - TD/D S - Technical Manual and other Logistics Support	MIPR	TBD : TBD	0.000	0.000		0.000		0.250	Nov 2019	-		0.250	Continuing	Continuing	0.000
CHRS - TD/D S - Manufactuting and Technology Readiness Assessments and Physical Configuration Audit	MIPR	TBD : TBD	0.000	0.000		0.000		0.400	Nov 2019	-		0.400	Continuing	Continuing	0.000
MDAP - TD/D SB - IPT and Technical Support	MIPR	Various : Various	0.330	0.145	Mar 2018	0.870	Nov 2018	0.831	Nov 2019	-		0.831	Continuing	Continuing	0.000
DFoS CIDAS - TD/D S - IPT and Technical Support	MIPR	Various : Various	2.898	1.723	Nov 2017	0.968	Dec 2018	1.149	Nov 2019	-		1.149	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBADS - TD/D S - IPT and Technical Support	MIPR	Various : Various	2.360	1.469	Nov 2017	1.580	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	5.588	3.337		3.418		3.606		-		3.606	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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		0.000		0.075	Nov 2019	-		0.075	Continuing	Continuing	0.000
DFoS CIDAS - OTHT S - Live Agent / Lab, Developmental, and Operational Testing	MIPR	Various : Various	3.405	1.634	Nov 2017	1.541	Dec 2018	2.169	Nov 2019	-		2.169	Continuing	Continuing	0.000
DFoS GPD - DTE S - Developmental Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	2.819	0.545	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JBADS - Analysis/ Studies JBADS for applicability for other platforms (vehicles, aircraft)	C/CPFF	TBD : TBD	0.000	0.000		0.210	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JBADS - Contractor Specification Testing/MIL-STD 810-G support	C/CPIF	TBD : TBD	0.000	0.000		1.800	Dec 2018	0.178	Nov 2019	-		0.178	Continuing	Continuing	0.000
JBADS - MIL-STD 810-G Test Planning/Testing	MIPR	Eglin AFB : Eglin Air Force Base, FL	0.000	0.004	Apr 2018	0.419	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JBADS - Other TE activities	Various	Various : Various	0.064	0.480	Nov 2017	0.300	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBADS - Vegetative Bacteria Decontamination Research	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.220	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	6.288	2.883		4.270		2.422		-		2.422	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CHRS - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.000	0.000		0.000		0.417	Nov 2019	-		0.417	Continuing	Continuing	0.000
MDAP - PM/MS SB - Program Management and Technical Support	MIPR	Various : Various	0.040	0.012	Jan 2018	0.255	Nov 2018	0.204	Nov 2019	-		0.204	Continuing	Continuing	0.000
DFoS CIDAS - SBIR/STTR - Reduction	Various	TBD : TBD	0.000	0.000		0.118	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
DFoS CIDAS - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	0.794	1.566	Nov 2017	1.167	Dec 2018	0.964	Nov 2019	-		0.964	Continuing	Continuing	0.000
JBADS - SBIR/STTR - Reduction	Various	TBD : TBD	0.000	0.000		0.306	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
JBADS - PM/MS S - Program Management & Tech Support	MIPR	Various : Various	2.655	0.676	Nov 2017	1.352	Dec 2018	0.044	Nov 2019	-		0.044	Continuing	Continuing	0.000
		Subtotal	3.489	2.254		3.198		1.629		-		1.629	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.056	10.162		14.049		8.267		-		8.267	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) DE5 / *DECONTAMINATION SYSTEMS (EMD)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

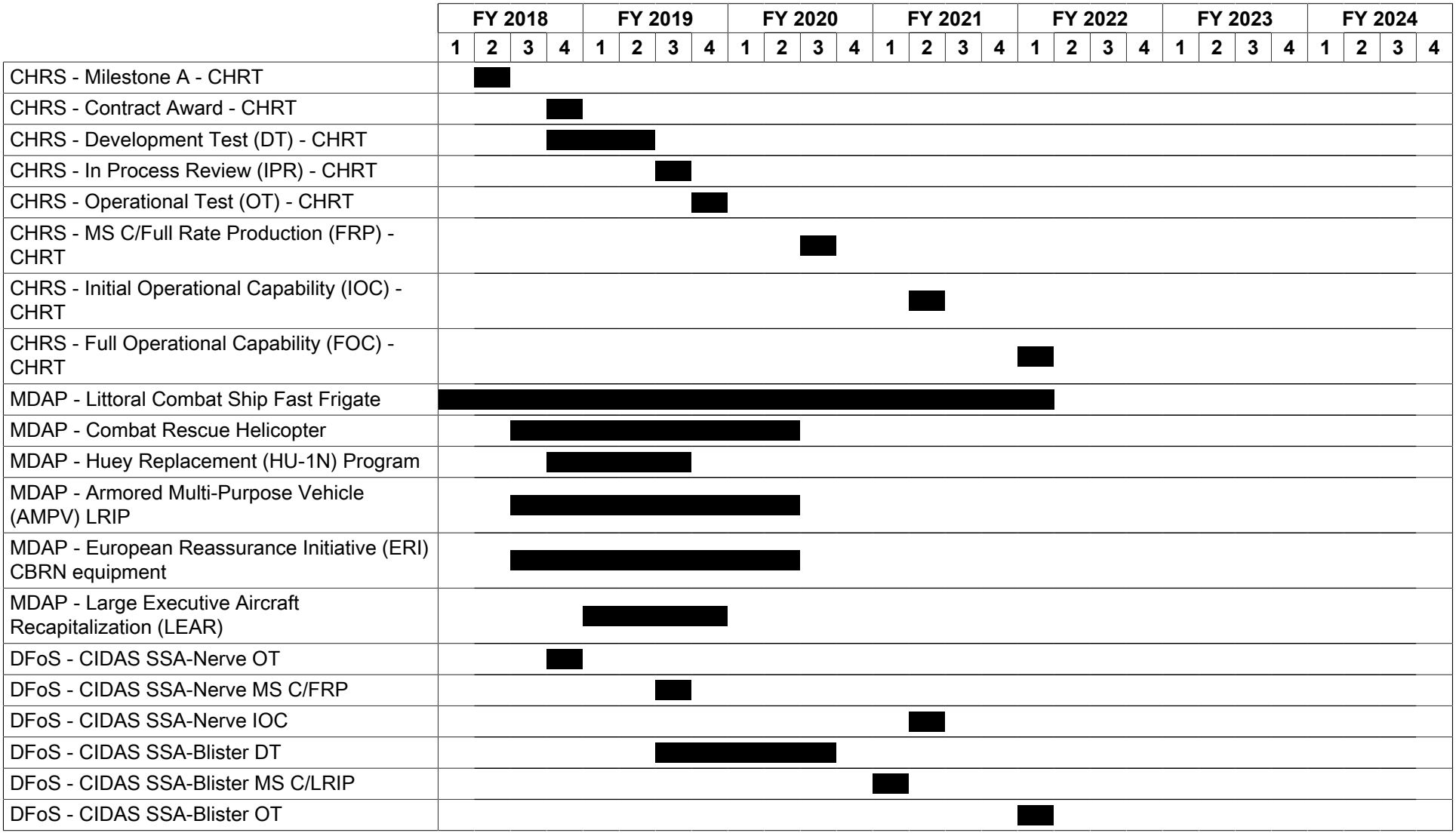

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

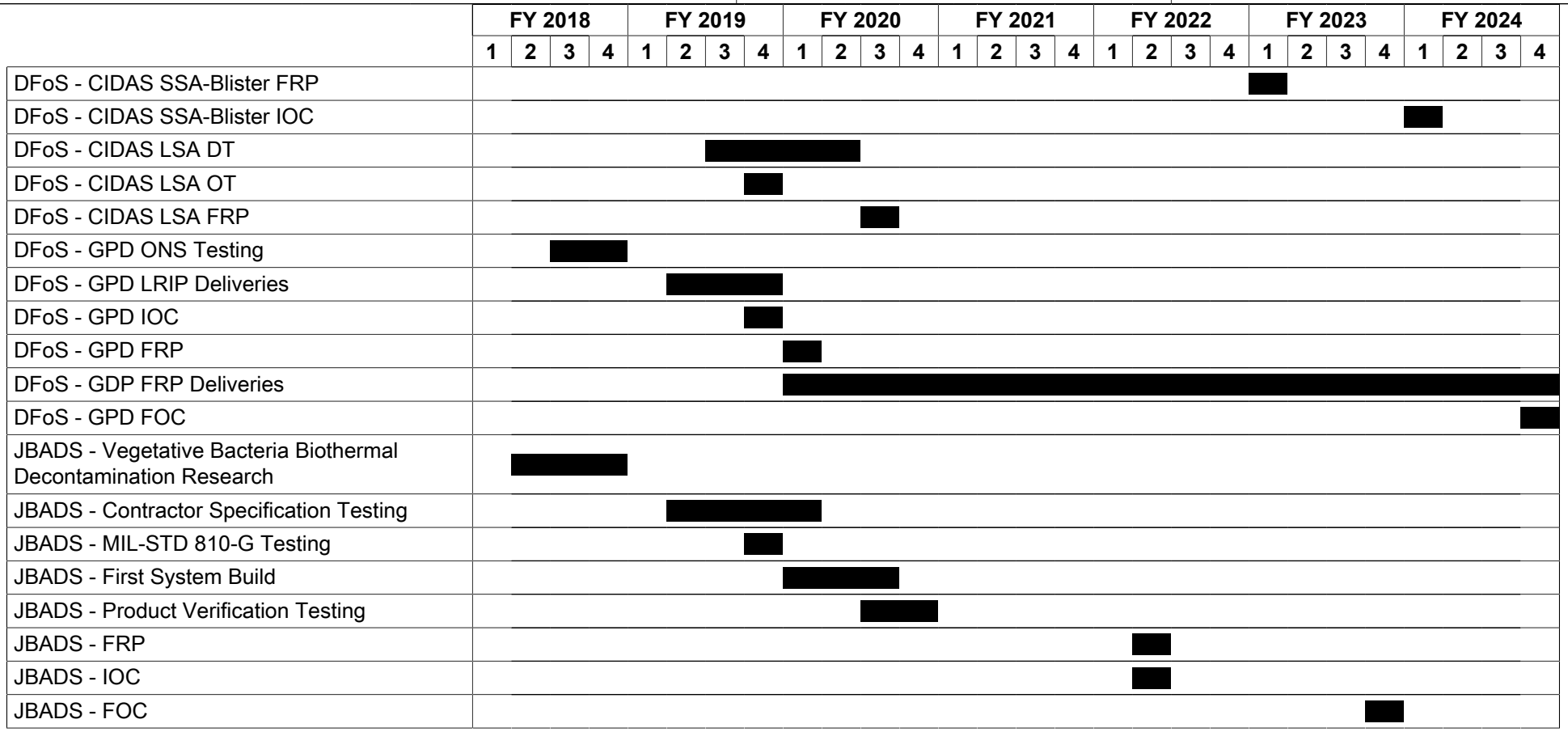

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CHRS - Milestone A - CHRT	2	2018	2	2018
CHRS - Contract Award - CHRT	4	2018	4	2018
CHRS - Development Test (DT) - CHRT	4	2018	2	2019
CHRS - In Process Review (IPR) - CHRT	3	2019	3	2019
CHRS - Operational Test (OT) - CHRT	4	2019	4	2019
CHRS - MS C/Full Rate Production (FRP) - CHRT	3	2020	3	2020
CHRS - Initial Operational Capability (IOC) - CHRT	2	2021	2	2021
CHRS - Full Operational Capability (FOC) - CHRT	1	2022	1	2022
MDAP - Littoral Combat Ship Fast Frigate	1	2018	1	2022
MDAP - Combat Rescue Helicopter	3	2018	2	2020
MDAP - Huey Replacement (HU-1N) Program	4	2018	3	2019
MDAP - Armored Multi-Purpose Vehicle (AMPV) LRIP	3	2018	2	2020
MDAP - European Reassurance Initiative (ERI) CBRN equipment	3	2018	2	2020
MDAP - Large Executive Aircraft Recapitalization (LEAR)	1	2019	4	2019
DFoS - CIDAS SSA-Nerve OT	4	2018	4	2018
DFoS - CIDAS SSA-Nerve MS C/FRP	3	2019	3	2019
DFoS - CIDAS SSA-Nerve IOC	2	2021	2	2021
DFoS - CIDAS SSA-Blister DT	3	2019	3	2020
DFoS - CIDAS SSA-Blister MS C/LRIP	1	2021	1	2021
DFoS - CIDAS SSA-Blister OT	1	2022	1	2022
DFoS - CIDAS SSA-Blister FRP	1	2023	1	2023
DFoS - CIDAS SSA-Blister IOC	1	2024	1	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** DE5 / *DECONTAMINATION SYSTEMS (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DFoS - CIDAS LSA DT	3	2019	2	2020
DFoS - CIDAS LSA OT	4	2019	4	2019
DFoS - CIDAS LSA FRP	3	2020	3	2020
DFoS - GPD ONS Testing	3	2018	4	2018
DFoS - GPD LRIP Deliveries	2	2019	4	2019
DFoS - GPD IOC	4	2019	4	2019
DFoS - GPD FRP	1	2020	1	2020
DFoS - GDP FRP Deliveries	1	2020	4	2024
DFoS - GPD FOC	4	2024	4	2024
JBADS - Vegetative Bacteria Biothermal Decontamination Research	2	2018	4	2018
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	3	2020	4	2020
JBADS - FRP	2	2022	2	2022
JBADS - IOC	2	2022	2	2022
JBADS - FOC	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) IP5 / *INDIVIDUAL PROTECTION (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
IP5: *INDIVIDUAL PROTECTION (EMD)*	-	13.529	9.324	12.663	-	12.663	13.013	11.162	11.343	11.342	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 (SPU) Rapid Capability Development and Deployment (RCDD)
(2) Joint Service Aircrew Mask (JSAM) Rotary Wing (RW), JSAM for Strategic Aircraft (SA), JSAM for Tactical Aircraft (TA)
(3) Uniform Integrated Protective Ensemble (UIPE) Family of Systems (FoS)

SPU RCDD will facilitate rapid JPEO-CBRND/JPL SOF RCDD 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. This funding directly underwrites operational relevance in a challenging geo-political landscape and within an ever-increasing threat environment. SPU RCDD mitigates risk across the CBDP by creating a portfolio of operationally-relevant 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.

The JSAM RW, JSAM SA, and JSAM TA are Acquisition Category (ACAT) III programs developed to provide respiratory and ocular protection. The JSAM 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, will provide the capability for all aircrew to operate in an actual or perceived CB warfare environment.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

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

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

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

Uniform Integrated Protection Ensemble (UIPE) Family of Systems (FoS). 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, non-traditional, and advanced chemical, biological, radiological, and nuclear/Toxic Industrial Material threats likely to be encountered during joint force operations.

In FY19, Uniform Integrated Protection Ensemble Increment 2 (UIPE 2) will be moved under Uniform Integrated Protection Ensemble Family of Systems (UIPE FoS) because the program will have more than one solution to meet the Warfighters needs. This is reflected in not only the name change but in the structure of the program. Instead of the program being driven towards meeting individual Service needs, the program is designed to meet mission area needs. There are four Mission Areas: Land, Air, Sea, and Homeland Defense. Each of the Mission Areas has unique mission requirements that the UIPE FoS solutions will seek to fulfill.

The acquisition strategy allows for multiple decision points throughout product development, which provides flexibility to accelerate mature commercial-off the-shelf/non-developmental item solutions and fully develop less mature solutions.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Special Purpose Unit Rapid Capability Development & Deployment (SPU RCDD)	-	-	3.399
Description: Development of specialized detection equipment for agent specific threats.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: Initiate rapid development and acquisition initiatives utilizing emergent chemical-biological defensive capabilities, decision support tools, and respiratory/ocular enhancements to support SOF counter-proliferation efforts and development of decontamination of SOF specialized equipment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is new start effort in FY 2020.			
Title: 2) JSAM RW ***Description:*** Multi-Service Operational Testing and Evaluation (MOT&E)	0.382	-	-
Title: 3) JSAM SA ***Description:*** Operational Testing and Evaluation ***FY 2019 Plans:*** Complete Operational Testing in the form of Integration and Airworthiness Certification testing on the KC-10 (USAF), C-17 (USAF), C-5 (USAF), C-9 (USMC), C-20 (USN/USMC) and C-26 (USA) aircraft. Conduct engineering studies to assess communication system adaptors and oxygen system adaptors for remaining aircraft. Update the Technical Manual to include specialized procedures for the various aircraft tested. ***FY 2020 Plans:*** Continue Developmental Testing, Integration Testing and Safe-to-Fly on various USAF aircraft. Continue engineering studies to assess communication system adaptors and oxygen system adaptors for various USAF aircraft. Update the Technical Manual to include specialized procedures for the various aircraft tested. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.	2.787	1.708	1.127
Title: 4) JSAM TA ***Description:*** Integration Testing Events and Milestone C Preparation ***FY 2019 Plans:*** Develop final test reports. Conduct Joint Integrated Logistics Assessment, Production Readiness Review, and Manufacturer Readiness Assessment. Finalize design changes and receive configuration control board approval for engineering changes.	3.501	2.097	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Obtain final Safe-to-Fly certification for all platforms. Prepare for and conduct MS C decision review. Develop package for the production contract. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.			
Title: 5) UIPE - Increment 2 ***Description:*** System Development and Demonstration/Engineering and Manufacturing Development	6.859	-	-
Title: 6) UIPE FoS ***Description:*** System Development and Demonstration/Engineering and Manufacturing Development ***FY 2019 Plans:*** Air Mission Area: Complete material level swatch testing, conduct System Testing, conduct USN integration testing, complete prototype manufacturing, conduct Manufacturing Readiness Assessment (MRA), receive USAF Fielding Decision Point, and complete the Joint Independent Logistics Assessment (JILA). ***FY 2020 Plans:*** Air Mission Area: 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). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	-	5.519	8.137
Accomplishments/Planned Programs Subtotals	13.529	9.324	12.663

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JI0002: *JS AIRCREW MASK (JSAM)*	25.086	54.775	69.416	-	69.416	72.863	67.612	50.622	8.280	Continuing	Continuing
• MA0401: *CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)*	10.508	13.064	9.984	-	9.984	13.415	3.553	0.000	0.000	0.000	50.524

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

D. Acquisition Strategy

SPU RAPID CAPABILITY DEVELOPMENT AND DEPLOYMENT (SPU RCDD)

SOF RCDD plans to execute non-traditional programs for capabilities identified by Joint Special Operations Command (JSOC), select elements from across the Special Operations Force (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.

JOINT SERVICE AIRCREW MASK ROTARY WING (JSAM RW)

The JSAM RW was developed under a competitive Cost Plus Fixed Fee (CPFF) contract, that included JSAM Apache and JSAM Apache Block III. A sole source Fixed Price Incentive (FPI) contract was awarded for LRIP. A Fixed Price modification to the sole source Low Rate Initial Production (LRIP) contract awarded June 2017 to complete USAF and initiate USA Total Package Fielding (TPF). Another Fixed Price modification will be awarded to the LRIP contract in September 2018. A competitive production contract with Firm Fixed Price (FFP) Production CLINs will be pursued for Full Rate Production (FRP). The Full Rate Production (FRP) contract will also include Cost Plus CLINS for the vendor to establish a production line at Pine Bluff Arsenal.

JOINT SERVICE AIRCREW MASK STRATEGIC AIRCRAFT (JSAM SA)

The JSAM SA acquisition approach involves modifying the fielded M53 ground mask design in order to add Pressure Breathing for Altitude (PBA), up to 40,000 feet above sea-level, and middle ear equalization capabilities. The JSAM SA mask is intended to be fielded to the United States Air Force (USAF), United States Navy (USN), United States Marine Corps (USMC), and United States Army (USA). The 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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Testing (OT) of assets to support Initial Operating Capability (IOC) fielding to USAF E-3, USN P-8, and USA MC-12 aircrew. The final test phase will consist of Integration and Airworthiness Certification (I&AC) testing for all remaining aircraft.

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 is planned to be awarded after Milestone C, will cover the activities during the Production and Deployment (PD) phase including all FRP builds.

JOINT SERVICE AIRCREW MASK TACTICAL AIRCRAFT (JSAM TA)

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

CBRN UNIFORM INTEGRATED PROTECTION ENSEMBLE (UIPE)

Reference UIPE FOS acquisition strategy.

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

The UIPE FoS will develop a family of systems that will provide the Warfighter percutaneous protection from operationally relevant traditional and non-traditional CBRN threats. The family of systems will be developed based on Service mission profiles (Land, Sea, Air and Homeland Defense) with the goal being to minimize operational burden and provide improved form, fit, function, and integration with the current Warfighter kits compared to legacy systems. An Other Transaction Authority (OTA) contracting approach will be used 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. Procurement will be through either the OTA or a more traditional contracting vehicle. UIPE FoS and the Services identified a mature solution that may meet Air Mission Area suit requirements. The program will identify data gaps from the United States Air Force's (USAF) test and evaluation of the Chemical, Biological, Radiological Layer (CBRL) of the Integrated Aircrew Ensemble. There is high confidence in the CBRL meeting the requirements for the Services.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - HW C - Prototype Procurement	Various	Various : Various	0.000	0.000		0.000		1.510	Dec 2019	-		1.510	Continuing	Continuing	0.000
JSAM SA - HW S - Modified M53 - Design Modification and Development	SS/CPFF	AVON Protection Systems Inc. : Cadillac, MI	3.648	0.842	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM TA - HW S - Hardware and Support Equipment for Integration and Test	SS/FFP	Cam Lock Limited : Aldershot Hampshire, UK	0.110	0.250	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - HW S - Trade Space Analysis	MIPR	TBD : TBD	0.000	0.000		0.500	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - HW S - UIPE FoS Prototype Development	Various	Various : Various	0.000	0.000		0.000		1.250	Nov 2019	-		1.250	Continuing	Continuing	0.000
		Subtotal	3.758	1.092		0.500		2.760		-		2.760	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - TD/D C - Technical Support	Various	Various : Various	0.000	0.000		0.000		0.342	Nov 2019	-		0.342	Continuing	Continuing	0.000
SPU RCDD - ES C - Engineering Support	Various	Various : Various	0.000	0.000		0.000		0.300	Dec 2019	-		0.300	Continuing	Continuing	0.000
JSAM RW - ES S - Integrated Product Team/ Engineering/Technical Support	MIPR	Various : Various	6.503	0.143	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - TD/D S - Logistics and IPT Support	MIPR	Various : Various	0.116	0.000		0.000		0.197	Nov 2019	-		0.197	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JSAM SA - ES S - Engineering and IPT Support	MIPR	Various : Various	3.333	0.342	Dec 2017	0.278	Dec 2018	0.230	Nov 2019	-		0.230	Continuing	Continuing	0.000
JSAM TA - ES S - Engineering Support	MIPR	Various : Various	4.262	1.990	Feb 2018	1.322	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - ES S - Program Engineering/Technical IPT	Various	Various : Various	0.000	2.072	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE - ILS S - Logistics Support	MIPR	Various : Various	0.170	0.334	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE - ES S - Engineering Support	MIPR	Various : Various	0.805	0.463	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - ES S - Program Eng/Tech IPT	Various	Various : Various	0.000	0.000		1.599	Dec 2018	2.616	Nov 2019	-		2.616	Continuing	Continuing	0.000
		Subtotal	15.189	5.344		3.199		3.685		-		3.685	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - DTE C - Testing and Evaluation	Various	Various : Various	0.000	0.000		0.000		0.700	Dec 2019	-		0.700	Continuing	Continuing	0.000
JSAM RW - OTE S - Multi-Service Operational Testing (USN/USMC)	MIPR	Various : Various	1.826	0.210	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - DTE S - Developmental Testing	MIPR	Various : Various	1.553	0.640	Nov 2017	0.000		0.459	Nov 2019	-		0.459	Continuing	Continuing	0.000
JSAM SA - OTE S - Operational Testing	MIPR	Various : Various	1.754	0.652	Nov 2017	1.084	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JSAM TA - DTE/ OTE S - Integrated Testing (combined DT/OT)	MIPR	Navy Operational Test and Eval Force (OPTEVFOR) : Norfolk, VA	0.191	0.117	Feb 2018	0.150	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JSAM TA - DTE S -Testing and Integration	MIPR	Various : Various	3.530	0.649	Feb 2018	0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - DTE S - Design Phase Activities	MIPR	Various : Various	0.000	2.553	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - DTE S - Design Verification Testing	MIPR	TBD : TBD	0.000	0.000		1.959	Dec 2018	2.530	Nov 2019	-		2.530	Continuing	Continuing	0.000
		Subtotal	8.854	4.821		3.393		3.689		-		3.689	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.547	Nov 2019	-		0.547	Continuing	Continuing	0.000
JSAM RW - PM/MS S - Program Management and Technical Support	Various	Various : Various	4.008	0.029	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSAM SA - PM/MS S - Program Management and Technical Support Services	MIPR	Various : Various	0.663	0.311	Nov 2017	0.282	Dec 2018	0.241	Nov 2019	-		0.241	Continuing	Continuing	0.000
JSAM SA - SBIR/STTR - reduction	Various	TBD : TBD	0.000	0.000		0.064	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
JSAM TA - SBIR/STTR - reduction	Various	TBD : TBD	0.000	0.000		0.079	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
JSAM TA - PM/MS S - Program Management and Technical Support	MIPR	Various : Various	1.578	0.495	Nov 2017	0.346	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
UIPE - PM/MS S - PM/ SME Prog Mgt	MIPR	Various : Various	0.000	1.437	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UIPE FOS - SBIR/STTR Reduction	Various	TBD : TBD	0.000	0.000		0.280	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
UIPE FOS - MS S - PM/ SME Prog Mgt	MIPR	Various : Various	0.000	0.000		1.181	Dec 2018	1.741	Nov 2019	-		1.741	Continuing	Continuing	0.000
		Subtotal	6.249	2.272		2.232		2.529		-		2.529	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.050	13.529		9.324		12.663		-		12.663	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

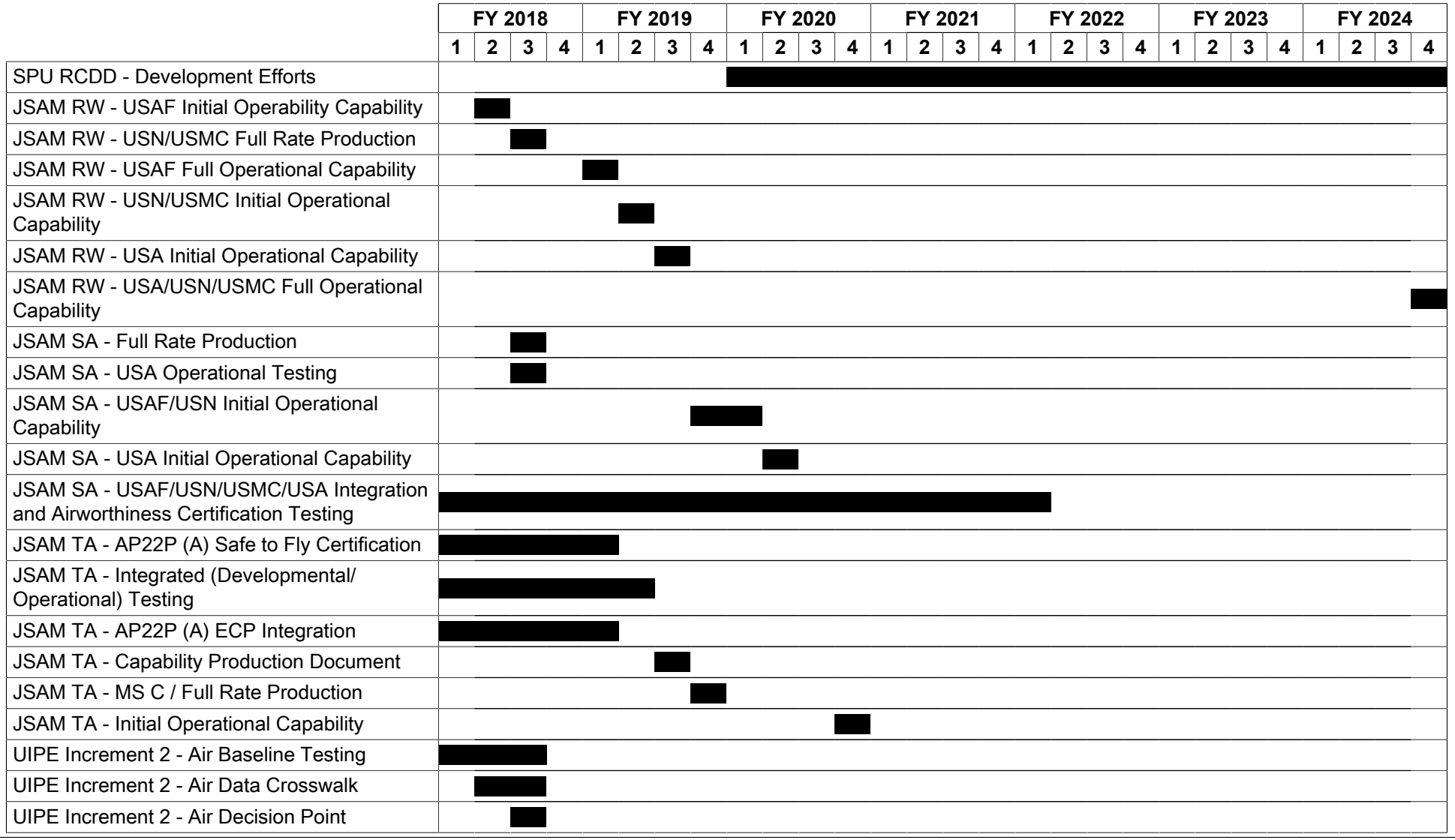

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

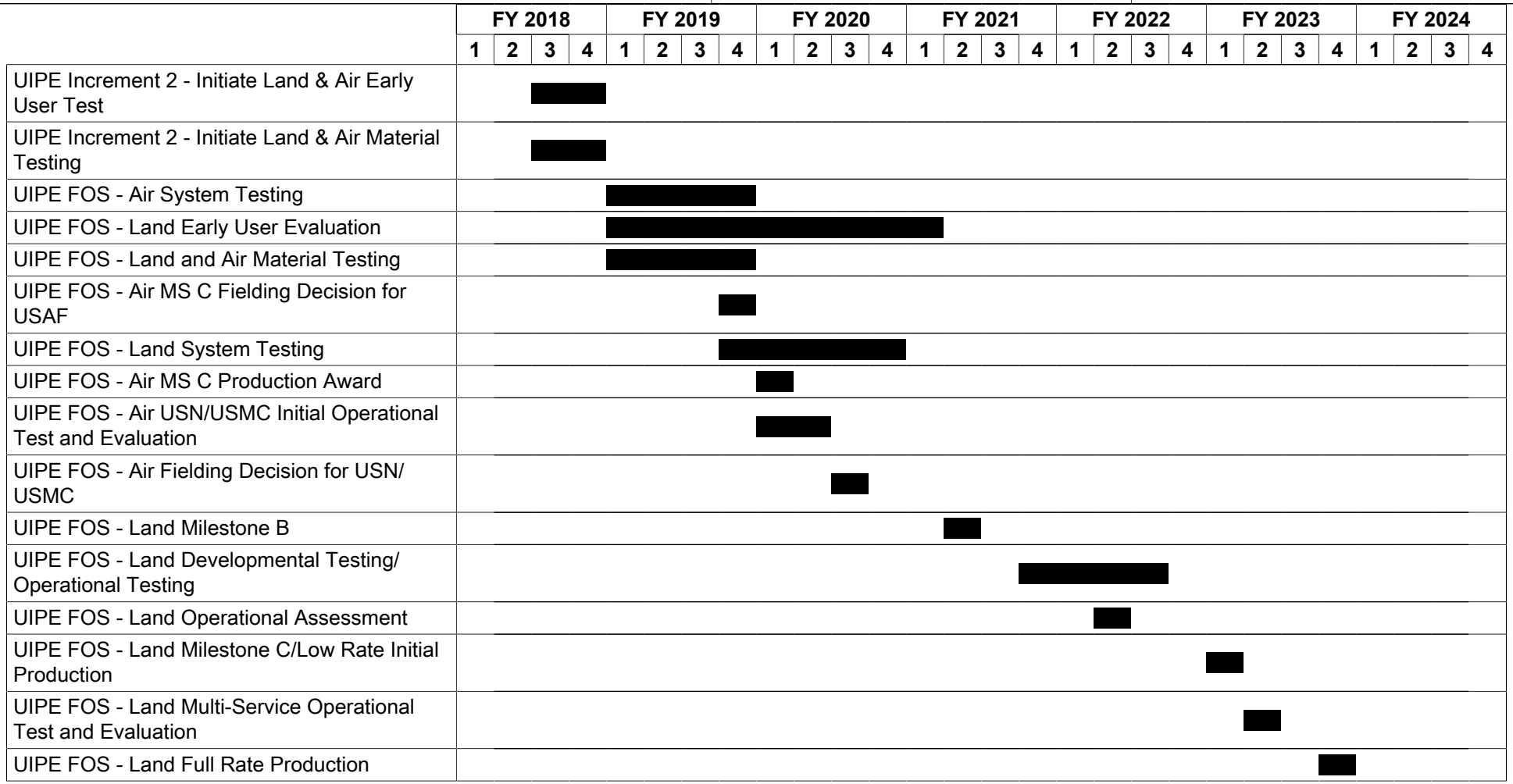

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SPU RCDD - Development Efforts	1	2020	4	2024
JSAM RW - USAF Initial Operability Capability	2	2018	2	2018
JSAM RW - USN/USMC Full Rate Production	3	2018	3	2018
JSAM RW - USAF Full Operational Capability	1	2019	1	2019
JSAM RW - USN/USMC Initial Operational Capability	2	2019	2	2019
JSAM RW - USA Initial Operational Capability	3	2019	3	2019
JSAM RW - USA/USN/USMC Full Operational Capability	4	2024	4	2024
JSAM SA - Full Rate Production	3	2018	3	2018
JSAM SA - USA Operational Testing	3	2018	3	2018
JSAM SA - USAF/USN Initial Operational Capability	4	2019	1	2020
JSAM SA - USA Initial Operational Capability	2	2020	2	2020
JSAM SA - USAF/USN/USMC/USA Integration and Airworthiness Certification Testing	1	2018	1	2022
JSAM TA - AP22P (A) Safe to Fly Certification	1	2018	1	2019
JSAM TA - Integrated (Developmental/Operational) Testing	1	2018	2	2019
JSAM TA - AP22P (A) ECP Integration	1	2018	1	2019
JSAM TA - Capability Production Document	3	2019	3	2019
JSAM TA - MS C / Full Rate Production	4	2019	4	2019
JSAM TA - Initial Operational Capability	4	2020	4	2020
UIPE Increment 2 - Air Baseline Testing	1	2018	3	2018
UIPE Increment 2 - Air Data Crosswalk	2	2018	3	2018
UIPE Increment 2 - Air Decision Point	3	2018	3	2018
UIPE Increment 2 - Initiate Land & Air Early User Test	3	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IP5 / *INDIVIDUAL PROTECTION (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
UIPE Increment 2 - Initiate Land & Air Material Testing	3	2018	4	2018
UIPE FOS - Air System Testing	1	2019	4	2019
UIPE FOS - Land Early User Evaluation	1	2019	1	2021
UIPE FOS - Land and Air Material Testing	1	2019	4	2019
UIPE FOS - Air MS C Fielding Decision for USAF	4	2019	4	2019
UIPE FOS - Land System Testing	4	2019	4	2020
UIPE FOS - Air MS C Production Award	1	2020	1	2020
UIPE FOS - Air USN/USMC Initial Operational Test and Evaluation	1	2020	2	2020
UIPE FOS - Air Fielding Decision for USN/USMC	3	2020	3	2020
UIPE FOS - Land Milestone B	2	2021	2	2021
UIPE FOS - Land Developmental Testing/Operational Testing	4	2021	3	2022
UIPE FOS - Land Operational Assessment	2	2022	2	2022
UIPE FOS - Land Milestone C/Low Rate Initial Production	1	2023	1	2023
UIPE FOS - Land Multi-Service Operational Test and Evaluation	2	2023	2	2023
UIPE FOS - Land Full Rate Production	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*				Project (Number/Name) IS5 / *INFORMATION SYSTEMS (EMD)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
IS5: *INFORMATION SYSTEMS (EMD)*	-	21.789	22.215	22.111	-	22.111	17.935	13.781	7.695	7.694	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). During this phase, efforts will execute development, cybersecurity hardening, testing and evaluation of capabilities to meet the defined requirements.

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

CBRN IS will support the implementation and integration 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. CBRN IS will expand cloud-based capability to Korean Peninsula and other Areas of Responsibility, as required. Additionally, it will continue to expand and provide the environment, net centric, cloud based tools and capabilities that are aligned with the current and future DoD IT/Cyber computing environments including Army Common Operating Environment (COE) and the Joint Information Environment (JIE). This will be integrated into a collaborative 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.
G-BSP will conduct Developmental and Operational Testing, and develop both a SIPR version and an International version of G-BSP. This will be integrated into a web-based enterprise environment that facilitates collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological hazards. This will result in a set of tools and capabilities that facilitate the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

JEM 2 will continue to develop, integrate, and test emerging capability defined in Requirements Definition Package 4. JEM 2 will continue to conduct user feedback events to ensure capability aligns with warfighter needs and perform independent operational test and evaluation to verify operation of the JEM 2 software in service command and control environments. This will be integrated into a web-based software application that supplies the Department of Defense (DoD) with the only operationally tested and accredited tool to effectively model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. This will provide warfighters with the ability to accurately model and predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM) events and effects. Additionally, this will support planning efforts to mitigate the effects of Weapons of Mass Destruction (WMD) and to provide rapid estimates of hazards and effects integrated into the Common Operational Picture (COP).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

JWARN 2 will to continue develop, integrate, and test emerging capability defined in Requirements Definition Packages 1 and 2 and integrate CBRN sensor/detector data/input with JWARN software baseline. JWARN 2 will continue to coordinate with operational forces for User Feedback Events, improving user interface and creating more efficient operational experience and conduct Multiservice Operational Test and Evaluation to verify operation of the JWARN 2 software in service command and control environments. This will be integrated into an accredited DoD warning and reporting system that enables an immediate and integrated response to threats of contamination by WMD, CBRN and TIM incidents. This will provide a digital display of CBRN 1-6 reports on the COP, displayed through Service provided C4I systems resident at all echelons of command. Commanders will be provided with enhanced situational awareness throughout the area of operation, supports warfighter battle management and continuity of operations in a contaminated environment.

As software-intensive systems, JEM 2, JWARN 2, and G-BSP have no separately identifiable unit production components; unit cost calculations including Program Acquisition Unit Cost/Average Procurement Unit Cost (PAUC/APUC) and Operations and Sustainment (O&S) average annual per unit costs are not applicable.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Global-BSP	6.064	3.787	3.047
Description: Product Development ***FY 2019 Plans:*** Develop SIPR version of Global-BSP to satisfy SOCOM-defined user requirements. Develop International version of Global-BSP to allow foreign partner access to system. This development work will include system changes to allow access by NATO, United Nations, and FVEY nations while safeguarding US interests. ***FY 2020 Plans:*** Continue to develop SIPR version of Global-BSP to satisfy SOCOM-defined user requirements. Continue to develop International version of Global-BSP to allow foreign partner access. Continue the development and integration of Global-BSP capabilities as required by the operational users, delivered in Capability Drops. Global-BSP will achieve Full Operational Capability (FOC).			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue improvements in architecture development, system design, key system tools, third party developed models, access to external data sources, cybersecurity and information assurance, and host platform design. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) Global-BSP ***Description:*** Developmental Test and Evaluation ***FY 2019 Plans:*** Global BSP will conduct a Developmental End-to-End Test following the release of two Capability Drops. ***FY 2020 Plans:*** Conduct Developmental Testing associated with two Capability Drops. Conduct Cybersecurity Penetration Test in conjunction with cloud host provider and Joint Interoperability Test Command (JITC) requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.910	0.358	0.295
Title: 3) Global-BSP ***Description:*** Program Management Support ***FY 2019 Plans:*** Global-BSP Program Management Office will continue to manage and conduct oversight of all aspects of Global-BSP program development and testing, to include Technical Exchange Meetings with warfighters, Developmental/Operational Testing, and Administration and execution of budgeted funding. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.753	0.793	0.466
Title: 4) Global-BSP ***Description:*** Operational Testing and Evaluation ***FY 2019 Plans:***	1.065	0.928	0.655

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Global-BSP will conduct Operational Testing with Special Operations Command units to further fulfill SOCOM-defined requirements and identify areas for increased capabilities. ***FY 2020 Plans:*** Conduct Final Operational Test & Evaluation (FOT&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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 5) Global-BSP ***Description:*** Training and Logistics Support ***FY 2020 Plans:*** Perform Training Development, Integrated Logistic Support, and Configuration Management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	-	0.199
Title: 6) CBRN IS ***Description:*** Technical Guidance ***FY 2019 Plans:*** Provide management and system engineering oversight for all aspects of the CBRN IS program. CBRN IS will initially integrate appropriate JPEO-CBD products into a Family of Systems (FoS) framework (to begin with JWARN, JEM and BSP). Align validated requirements into an enterprise approach. Provide strategy for integration of future capabilities and emerging requirements including advanced technology demonstrations (ATDs), experimental capability demonstrations (ECDs) for Integrated Early Warning, Decision Support/ Consequence and Incident Management, Data Analytics and other analytical and situational awareness tools. ***FY 2020 Plans:***	0.224	0.226	0.217

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 7) CBRN IS ***Description:*** Standardization ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.573	0.362	0.575
Title: 8) CBRN IS ***Description:*** Cybersecurity / Information Assurance ***FY 2019 Plans:*** Provide guidance and direction for the implementation of ongoing cybersecurity requirements and policies and DoD information assurance vulnerability alerts (IAVAs) to mitigate system vulnerabilities and avoid serious compromise of the CBRN IS environment that would potentially degrade mission performance. ***FY 2020 Plans:***	0.202	0.210	0.203

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue the implementation of ongoing cybersecurity requirements and policies and DoD information assurance vulnerability alerts (IAVAs) to mitigate system vulnerabilities and avoid serious compromise of the CBRN IS environment that would potentially degrade mission performance. Continue adversarial and cooperative vulnerability testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 9) CBRN IS ***Description:*** Product Development ***FY 2019 Plans:*** Transition to production and deployment phase efforts, post IOC. Continue coordination with Services and integrated early warning (IEW) advanced technology demonstration (ATD) and integrated early warning (IEW) experimental capability demonstration (ECD) projects to determine prioritization of CBRN and IEW capabilities to be developed, transitioned and integrated into CBRN IS through subsequent capability drops. These capability drops will continue throughout the production and deployment phase with two capability drops planned per FY. ***FY 2020 Plans:*** Continue to develop additional capabilities, applications and implementations to support the National Defense priorities for combatting weapons of mass destruction. Continue to integrate JPEO CBRND products into a family-of-systems (FOS) framework. Rapidly transition select DoD Components or agencies to the acquired cloud solution, and, to the maximum extent possible, operationalize its mission using the security, software, and machine learning capabilities that cloud technology provides. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.936	1.059	1.025
Title: 10) CBRN IS ***Description:*** Operational Assessments ***FY 2019 Plans:*** Conduct 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. ***FY 2020 Plans:***	0.470	0.695	0.480

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 11) JEM 2 ***Description:*** Developmental Test and Evaluation ***FY 2019 Plans:*** Continue Government Development Test of software deliveries in Command and Control (C2) environments. Perform verification, validation, and accreditation of new hazard prediction models provided by the S&T community as defined in Requirements Definition Package 4 (RDP-4), Emerging Capability. ***FY 2020 Plans:*** Continue Government Development Test of software deliveries in preparation for Initial Operational Test & Evaluation (IOT&E) for development to C2 systems. Continue to perform VV&A of new hazard prediction models provided by the S&T community as defined in RDP-4. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	0.509	0.407	0.420
Title: 12) JEM 2 ***Description:*** Product Development ***FY 2019 Plans:*** Continue development of JEM 2 software and perform integration into Command and Control (C2) systems. Integrate new hazard prediction models provided by the S&T community into the JEM 2 baseline software and develop/transition new S&T capabilities as defined in Requirements Definition Package 4 (RDP-4), Emerging Capability. ***FY 2020 Plans:*** Continue development of JEM 2 software and perform integration into C2 systems. Integrate new hazard prediction models provided by the S&T community into the JEM 2 baseline software and develop/transition new S&T capabilities as defined in Requirements Definition Package RDP-4. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.557	1.130	1.443

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Minor change due to routine program adjustments.			
Title: 13) JEM 2 ***Description:*** Program Management ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.541	0.269	0.521
Title: 14) JEM 2 ***Description:*** Operational Test and Evaluation ***FY 2019 Plans:*** Develop operational test plans and conduct lab based OT and limited scope service specific IOT&E to support fielding decisions for the JEM 2 software. ***FY 2020 Plans:*** Develop operational test plans and conduct lab based OT and limited scope service specific IOT&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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.826	0.896	0.782
Title: 15) JEM 2 ***Description:*** Training and Logistics Support	-	-	0.842

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: Perform Training Development, Integrated Logistics Support and Configuration Management for upgraded fielded capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 16) JWARN 2 ***Description:*** Management Support ***FY 2019 Plans:*** Provide program/financial management, costing, contracting, scheduling and acquisition oversight for JWARN 2. Continue development and execution of Build Decisions (BDs) for JWARN 2 while working within the agile development process, to include performing a Joint Integrated Logistics Assessment (JILA) and Logistics' Demonstration (LOG DEMO) in preparation for test and deployment of JWARN 2 to the services. ***FY 2020 Plans:*** 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 (CD 2.1), Army BCCS and COE v3 host systems (CD 2.2), DISA GCCS-J environment (CD 2.3), Navy CANES afloat architecture and Maritime Operations Centers (MOCs) (CD 2.5), and National Guard host systems (CD 2.6). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.561	0.921	0.834
Title: 17) JWARN 2 ***Description:*** Product Development ***FY 2019 Plans:*** Continue JWARN 2 software development and perform integration into Command and Control (C2) systems and integration of CBRN sensor/detector data/input with JWARN software baseline. JWARN 2 software development and perform integration into the Army's Common Operational Environment version 3 (COE v3) to provide convergence with other Army COE services. Complete Information Assurance Certification and accreditation to support Multiservice Operation Test and Evaluation (MOT&E). Initiating transitioning False Sensor Alert Reduction prototyping into JWARN software development. ***FY 2020 Plans:***	2.928	5.239	5.002

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue JWARN RDP-1 CD 1.5 development and integration of CBRN sensor/detector data/input with JWARN software baseline including the integration of below integration threshold detection with sensor networking for improved false alarm reduction. Continue Information Assurance Certification and accreditation to support cybersecurity of deployed JWARN RDP-1 CDs in the milCloud CBRN IS enterprise environment (CD 2.1), Army BCCS and COE v3 host systems (CD 2.2), DISA GCCS-J environment (CD 2.3), Navy CANES afloat architecture and Maritime Operations Centers (MOCs) (CD 2.5), and National Guard host systems (CD 2.6). Continue software development in preparation for Initial Operational Test and Evaluation (IOT&E) of JWARN RDP-1 capabilities on National Guard host systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 18) JWARN 2 ***Description:*** Developmental Test and Evaluation ***FY 2019 Plans:*** Continue Government development test and evaluation of software deliveries in preparation for annual Multiservice Operational Test and Evaluation (MOT&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&E for development to COE v3. ***FY 2020 Plans:*** Perform Government development test and evaluation, including software delivery acceptance testing, of improved JWARN baseline software capabilities, and verify continued interoperability with Joint and Service C2 host systems. Conduct developmental test and evaluation of JWARN in preparation for IOT&E on RDP-2 CD 2.6 National Guard C2 systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.674	0.742	0.567
Title: 19) JWARN 2 ***Description:*** Operational Test and Evaluation ***FY 2019 Plans:*** Conduct Multiservice Operational Test and Evaluation (MOT&E) which will allow for additional Capability Drops (CDs) with added JWARN 2 capabilities and functionality to be deployed to the services. Conduct a OT&E of JWARN 2 in preparation for deployment to COE v3. ***FY 2020 Plans:***	0.956	1.097	0.850

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Conduct Multiservice Operational Test & Evaluation (MOT&E), which will allow for additional capability drops (CDs) with added JWARN capabilities and functionality to be deployed to the services. Conduct IOT&E of JWARN RDP-1 CDs in preparation for deployment to RDP-2 CD 2.6 National Guard C2 systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 20) JWARN 2 ***Description:*** Training and Logistics Support ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	-	1.084
Title: 21) SSA ***Description:*** Policies, Standards and Guidelines ***FY 2019 Plans:*** Continue updates to acquisition documentation for CBRN IT systems based on changes in policy, procedures, and guidelines. Perform surveillance of Federal Information Security Management Act (FISMA) and DoD Acquisition policies necessary to maintain certification on deployed service platforms. Provide M&S strategic and accreditation support. ***FY 2020 Plans:*** Provides 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. Helps programs achieve a mandated net-centric environment by providing enabling tools for data management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.200	0.343	0.100
Title: 22) SSA ***Description:*** Integrated Architecture	0.251	0.403	0.118

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue to perform required modifications to the Integrated Architecture on host platforms and document the infrastructure and technical standards. Conduct Net-Centric Assessments for programs. Review and update the Common CBRN Interface standards on operational systems, including a Common CBRN Sensor Integration Standard (CCSI). ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 23) SSA ***Description:*** Enterprise Support and Services ***FY 2019 Plans:*** Continue to support processes and services for Cybersecurity/Information Assurance, Architectures, Modeling and Simulation, Science and Technology, and Standards and Policy. Modify support processes and services necessary to maintain relevancy in accordance with DoD standards, policies, and guidelines. ***FY 2020 Plans:*** Provides 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.165	0.287	0.347
Title: 24) SSA ***Description:*** Chemical, Biological, Radiological, Nuclear (CBRN) Data Model ***FY 2019 Plans:*** Continue to develop and update CBRN data model and define the structure and content of information exchange "Extensible	0.597	0.323	0.700

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Markup Language"(XML) schemas that support interoperability between CBD programs. ***FY 2020 Plans:*** Assists 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 25) SSA ***Description:*** Cybersecurity / Information Assurance ***FY 2019 Plans:*** Continue to employ Information Systems Security Engineering (Cybersecurity) efforts to develop or modify the Cybersecurity/ Information Assurance (CS/IA) component of a system architecture to ensure it is in compliance with the IA component of the Global Information Grid architecture, and makes maximum use of enterprise CS/IA capabilities and services. ***FY 2020 Plans:*** Continue to 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.476	0.743	0.693
Title: 26) SSA ***Description:*** Policy and Standards Repository ***FY 2019 Plans:*** Continue to provide standards, formats, templates, training, and best practices to support practical compliance with laws, regulations, and policy for acquisition, certification, and sustainment of net-centric, interoperable, and spectrum dependent systems and devices. ***FY 2020 Plans:***	0.200	0.578	0.200

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Provides 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. Helps programs achieve a mandated net-centric environment by providing enabling tools for data management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 27) SSA ***Description:*** Technology Transition Support ***FY 2019 Plans:*** Continue to perform Technology Transition support services (common components and services) for CBD programs. ***FY 2020 Plans:*** Continue to provide innovation, management and implementation of science and technology initiatives in support of JPEO CBRND systems across the enterprise to improve warfighter capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.151	0.419	0.446
Accomplishments/Planned Programs Subtotals	21.789	22.215	22.111

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• IS7: *INFORMATION SYSTEMS (OP SYS DEV)*	11.923	15.051	16.811	-	16.811	16.133	14.916	12.993	12.993	Continuing	Continuing
• G47101: *JOINT WARNING & REPORTING NETWORK (JWARN)*	0.933	0.502	0.442	-	0.442	0.394	0.370	0.375	0.375	Continuing	Continuing
• JC0208: *JOINT EFFECTS MODEL (JEM)*	0.880	0.911	0.689	-	0.689	0.720	0.735	0.749	0.749	Continuing	Continuing
• JS5230: *SOFTWARE SUPPORT ACTIVITY (SSA)*	0.092	0.094	0.081	-	0.081	0.074	0.070	0.067	0.067	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

D. Acquisition Strategy

BIOSURVEILLANCE PORTAL (BSP)

The Global-Biosurveillance Portal (Global-BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The Global-BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20. The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

CBRN INFORMATION SYSTEMS

CBRN-IS acquisition strategy utilizes a Family-of-Systems (FoS) approach to align multiple programs of record capabilities to the CBRN-IS architecture and operational environment. CBRN-IS enterprise will initially integrate appropriate JPEO-CBD products into a FoS framework beginning with the Joint Warning and Reporting (JWARN) and Joint Effects Model (JEM) program capabilities. 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 the inclusion of mature science and technology products and emerging technologies from existing ATD and experimental capability demonstrations (ECD). CBRN-IS utilizes the Agile software development process with the IT Box acquisition strategy to provide for the spiral development and fielding of modular capability packages.

JOINT EFFECTS MODEL (JEM)

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

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

portions of capability are determined suitable and operationally effective. These multiple fielding efforts are based on providing capabilities with the most value to the operators based on Warfighter priorities/needs, maturation of the technology being incorporated and available resources supporting the effort.

As part of this strategy a single JEM 2 integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in March 2017.

The current contractor for JEM 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1, CD 2.2, and CD 2.3 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The contract awarded in March 2017 includes scope for developing the remaining capabilities under the JEM 2 contract. The contract utilizes full and open competition and is referred to as the JEM 1 and 2 development, modernization and sustainment contract.

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

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

JOINT WARNING & REPORTING NETWORK (JWARN)

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

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

The JWARN 2 Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

The current contractor for JWARN 2, Northrup Grumman, will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1) and RDP-2 documents.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

As part of the strategy for a single JWARN 2 integrator, a follow-on contract was awarded in December 2018. The follow-on contractor, DCS Corp, for JWARN 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The follow-on contract in FY18 will include scope for developing the remaining capabilities under the JWARN contract. The JWARN 2 follow-on contract will utilize full and open competition and will be referred to as the JWARN 2 software development and maintenance contract.

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

SOFTWARE SUPPORT ACTIVITY (SSA)

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

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - SW S - software -Global-BSP software development	FFRDC	Johns Hopkins University - Applied Physics Lab : Laurel, MD	14.636	6.064	Mar 2018	3.787	Dec 2018	2.797	Dec 2019	-		2.797	Continuing	Continuing	0.000
CBRN IS - SW S - software - integration with BSP, JEM, JWARN	MIPR	Various : Various	0.942	0.936	Dec 2017	1.058	Dec 2018	1.025	Dec 2019	-		1.025	Continuing	Continuing	0.000
JEM - SW SB -2 - Hazard Prediction Model Development and Integration	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	12.519	1.277	Apr 2018	1.682	Apr 2019	1.964	Apr 2020	-		1.964	Continuing	Continuing	0.000
JWARN - 2- SW S - Soft Dev Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.000	0.000		5.239	Dec 2018	5.002	Dec 2019	-		5.002	Continuing	Continuing	0.000
JWARN - 1&2- SW S - Software Development	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	6.978	3.657	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
SSA - SW S - CBRN Data Model	C/CPAF	Various : Various	7.656	0.597	Mar 2018	1.003	Mar 2019	0.700	Mar 2020	-		0.700	Continuing	Continuing	0.000
		Subtotal	42.731	12.531		12.769		11.488		-		11.488	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN IS - ES S - Support Costs - Cybersecurity and IA updates, architecture documentation	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	1.313	0.572	Dec 2017	0.565	Dec 2018	0.672	Dec 2019	-		0.672	Continuing	Continuing	0.000
JEM - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.000		0.000		0.321	Apr 2020	-		0.321	Continuing	Continuing	0.000
JWARN - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.000		0.000		1.084	Apr 2020	-		1.084	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) IS5 / *INFORMATION SYSTEMS (EMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSA - ES S - Support Costs	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	9.069	0.535	Dec 2017	0.946	Dec 2018	1.804	Dec 2019	-		1.804	Continuing	Continuing	0.000
		Subtotal	10.382	1.107		1.511		3.881		-		3.881	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - DTE S - Software	MIPR	Various : Various	2.315	0.910	Dec 2017	0.358	Dec 2018	0.488	Dec 2019	-		0.488	Continuing	Continuing	0.000
BSP - OTE S - Software - MOT&E	MIPR	Various : Various	2.679	1.065	Dec 2017	0.928	Dec 2018	0.911	Dec 2019	-		0.911	Continuing	Continuing	0.000
CBRN IS - OTE S - Operational Test - service-specific testing, joint test	MIPR	Various : Various	0.706	0.598	Dec 2017	0.679	Dec 2018	0.675	Dec 2019	-		0.675	Continuing	Continuing	0.000
JEM - DTE SB - 2 - Hazard Prediction Model Development Test	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	9.834	0.350	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JEM - OTHT C - Increment 2 - OT&E Hazard Prediction Modeling software	MIPR	Various : Various	2.821	0.832	Dec 2017	0.440	Dec 2018	1.202	Dec 2019	-		1.202	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	1.123	0.382	Dec 2017	1.839	Dec 2018	0.567	Dec 2019	-		0.567	Continuing	Continuing	0.000
JWARN - 2 - OTE S - Multi-service Operational Test and Evaluation of JWARN 2 software	MIPR	Various : Various	2.555	0.519	Jan 2018	0.000		0.850	Dec 2019	-		0.850	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSA - DTE S - Test and Evaluation	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	4.180	0.757	Dec 2017	0.751	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	26.213	5.413		4.995		4.693		-		4.693	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - PM/MS S - Program Management	Various	Various : Various	2.167	0.753	Dec 2017	0.793	Dec 2018	0.466	Dec 2019	-		0.466	Continuing	Continuing	0.000
CBRN IS - PM/MS S - Program Management - Planning, Programming, and Budgeting	MIPR	Various : Various	0.250	0.299	Dec 2017	0.250	Dec 2018	0.128	Dec 2019	-		0.128	Continuing	Continuing	0.000
JEM - PM/MS S - Program Office - Planning and Programming	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	7.748	0.974	Dec 2017	0.580	Dec 2018	0.521	Dec 2019	-		0.521	Continuing	Continuing	0.000
JWARN - 2- PM/MS C - Program Management Support	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	1.469	0.561	Dec 2017	0.921	Nov 2018	0.834	Dec 2019	-		0.834	Continuing	Continuing	0.000
SSA - PM/MS S - Management Services	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.202	0.151	Dec 2017	0.396	Dec 2018	0.100	Dec 2019	-		0.100	Continuing	Continuing	0.000
		Subtotal	14.836	2.738		2.940		2.049		-		2.049	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	94.162	21.789		22.215		22.111		-		22.111	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) IS5 / *INFORMATION SYSTEMS (EMD)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

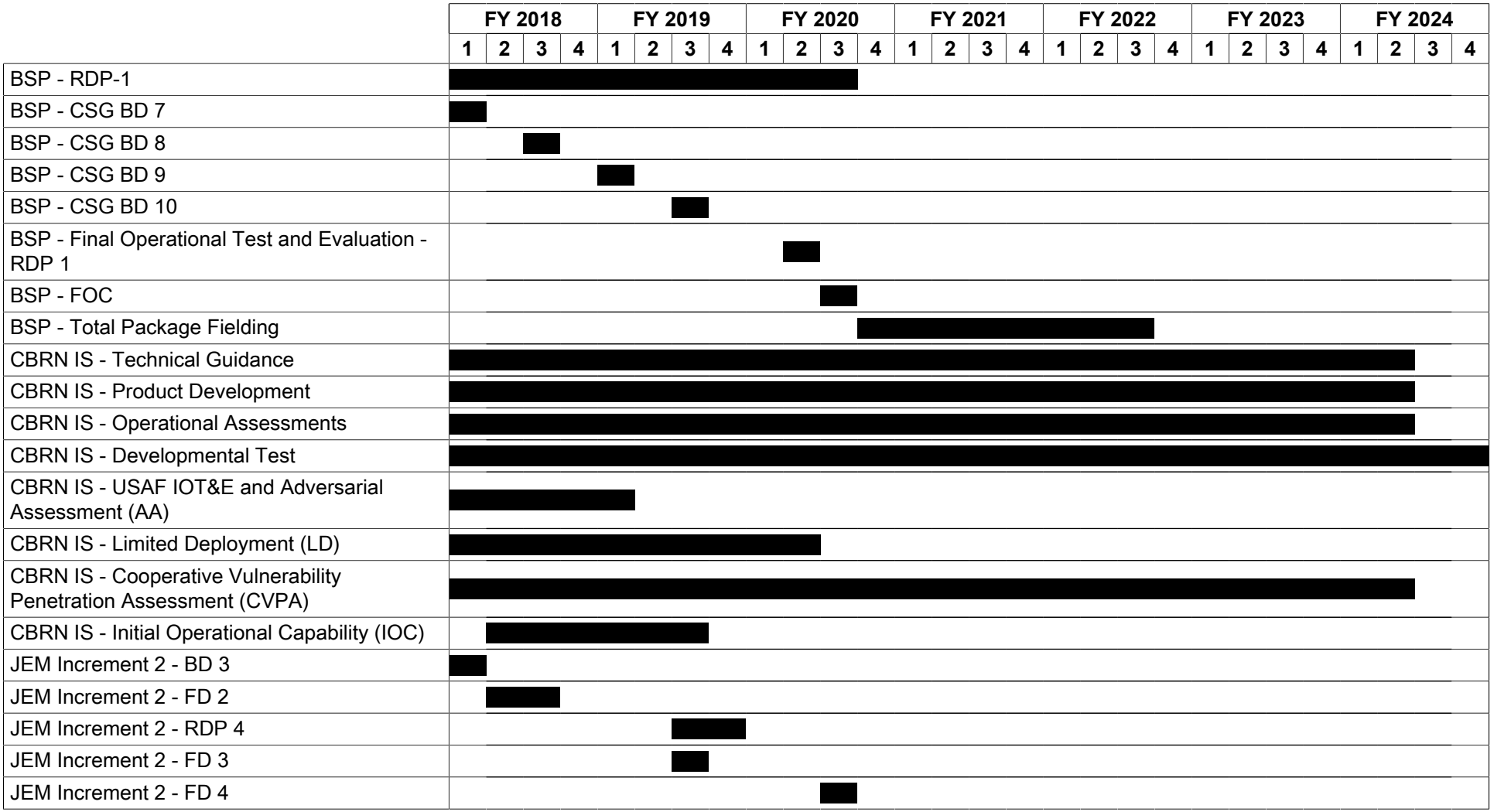

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

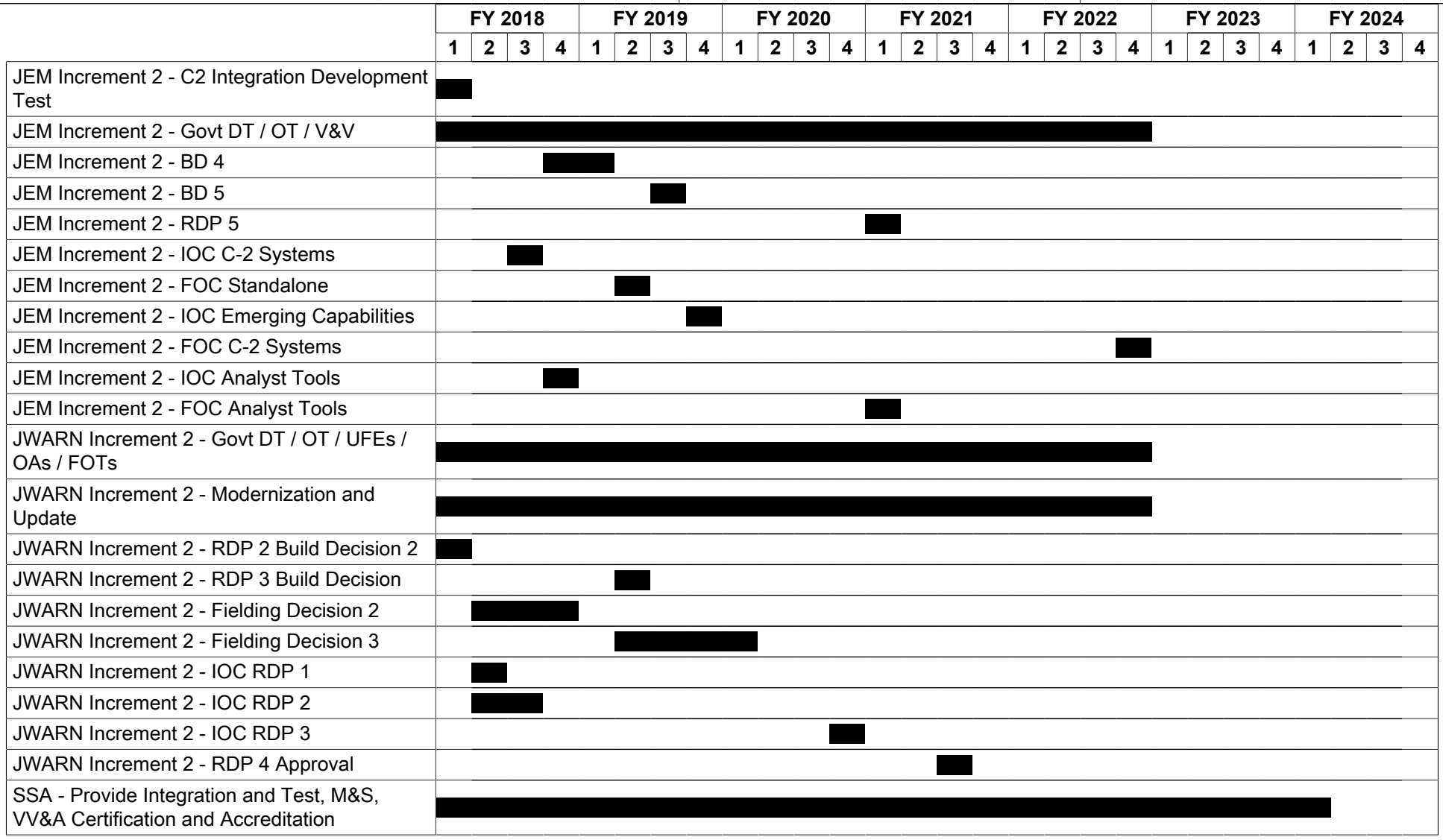

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

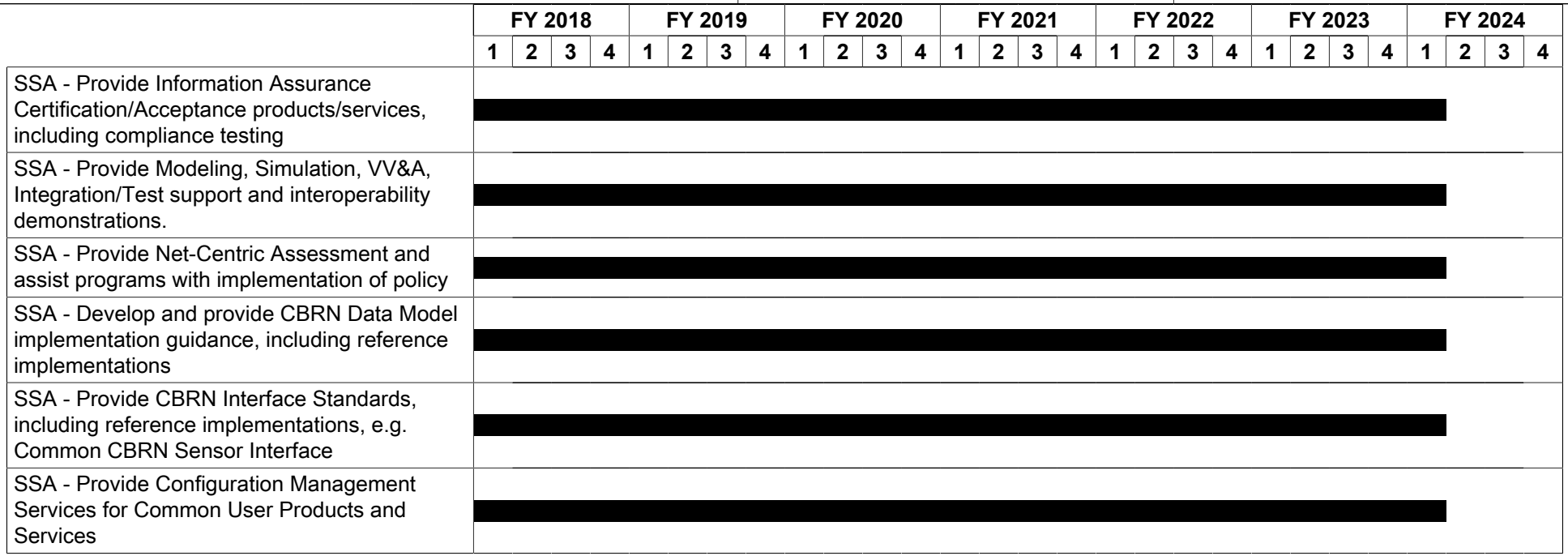

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BSP - RDP-1	1	2018	3	2020
BSP - CSG BD 7	1	2018	1	2018
BSP - CSG BD 8	3	2018	3	2018
BSP - CSG BD 9	1	2019	1	2019
BSP - CSG BD 10	3	2019	3	2019
BSP - Final Operational Test and Evaluation - RDP 1	2	2020	2	2020
BSP - FOC	3	2020	3	2020
BSP - Total Package Fielding	4	2020	3	2022
CBRN IS - Technical Guidance	1	2018	2	2024
CBRN IS - Product Development	1	2018	2	2024
CBRN IS - Operational Assessments	1	2018	2	2024
CBRN IS - Developmental Test	1	2018	4	2024
CBRN IS - USAF IOT&E and Adversarial Assessment (AA)	1	2018	1	2019
CBRN IS - Limited Deployment (LD)	1	2018	2	2020
CBRN IS - Cooperative Vulnerability Penetration Assessment (CVPA)	1	2018	2	2024
CBRN IS - Initial Operational Capability (IOC)	2	2018	3	2019
JEM Increment 2 - BD 3	1	2018	1	2018
JEM Increment 2 - FD 2	2	2018	3	2018
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 - C2 Integration Development Test	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JEM Increment 2 - Govt DT / OT / V&V	1	2018	4	2022
JEM Increment 2 - BD 4	4	2018	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - RDP 5	1	2021	1	2021
JEM Increment 2 - IOC C-2 Systems	3	2018	3	2018
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JEM Increment 2 - FOC C-2 Systems	4	2022	4	2022
JEM Increment 2 - IOC Analyst Tools	4	2018	4	2018
JEM Increment 2 - FOC Analyst Tools	1	2021	1	2021
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2018	4	2022
JWARN Increment 2 - Modernization and Update	1	2018	4	2022
JWARN Increment 2 - RDP 2 Build Decision 2	1	2018	1	2018
JWARN Increment 2 - RDP 3 Build Decision	2	2019	2	2019
JWARN Increment 2 - Fielding Decision 2	2	2018	4	2018
JWARN Increment 2 - Fielding Decision 3	2	2019	1	2020
JWARN Increment 2 - IOC RDP 1	2	2018	2	2018
JWARN Increment 2 - IOC RDP 2	2	2018	3	2018
JWARN Increment 2 - IOC RDP 3	4	2020	4	2020
JWARN Increment 2 - RDP 4 Approval	3	2021	3	2021
SSA - Provide Integration and Test, M&S, VV&A Certification and Accreditation	1	2018	1	2024
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2018	1	2024
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2018	1	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** IS5 / *INFORMATION SYSTEMS (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SSA - Provide Net-Centric Assessment and assist programs with implementation of policy	1	2018	1	2024
SSA - Develop and provide CBRN Data Model implementation guidance, including reference implementations	1	2018	1	2024
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2018	1	2024
SSA - Provide Configuration Management Services for Common User Products and Services	1	2018	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MB5: *MEDICAL BIOLOGICAL DEFENSE (EMD)*	-	130.240	117.331	119.227	-	119.227	97.501	71.221	78.435	82.815	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) Medical Countermeasure Platform Technologies (MCMPT)
(2) Joint Mobile Emerging Disease Intervention Clinical Capability (JMEDICC)
(3) Advanced Development and Manufacturing (ADM) facility
(4) Countermeasures for Multi-Drug Resistance-Bacterial (CMDR-B)
(5) Next Generation Diagnostic System (NGDS)
(6) Defense Biological Products Assurance Program (DBPAP)
(7) Antiviral Therapeutic Program (AV TX)
(8) Botulinum Vaccine (VAC BOT)
(9) Antiviral Prophylaxis Studies (Congressional Interest Item)
(10) Next Generation Anthrax Vaccine (VAC NGA)
(11) Plague Vaccine (VAC PLG)
(12) Special Immunizations Program (VAC SIP)

The 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. The first platform being established as part of an Advanced Technology Demonstration (ATD) is the Advanced Development and Manufacturing Antibody Technologies (ADAMANT). A second platform technology will be established which will focus on a vaccine platform capability. 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 MCMPT capability. The goal of the MCMPT is to counter a variety of threat agents using standardized discovery, design, manufacturing, and testing processes to reduce the MCM development risks. Efforts will center on leveraging the DoD's Advanced Development Manufacturing (ADM) facility and developing robust manufacturing processes.

The 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 currently under the Antiviral Therapeutic Program (AV TX) whose resulting capability offers a mechanism to greatly accelerate the development of life-saving products for future outbreaks.

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. In FY20 the Department is providing dedicated funds to support operational availability.

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 (CAPB) that was required as part of the acquisition strategy for the antibiotic repurposing program from S&T to advanced development.

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 Inc 1 offers improved operational suitability and affordability over legacy systems by developing FDA cleared biological warfare agent (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.

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 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 Advanced Development Manufacturing (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. Development of models to test for alphavirus therapeutics are also in work. 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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

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 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 Plaguevaccines. Efforts to be conducted during the Engineering Manufacturing Development (EMD) Phase include the development of large scale manufacturing process and validation of that process, nonclinical studies, demonstration of manufacturing consistency, and expanded clinical human safety studies. The results of these efforts, and those conducted during the EMD phase, will be used to submit a Biologic License Application (BLA) to the Food and Drug Administration (FDA) for product licensure. To evaluate vaccine effectiveness, pivotal animal studies will be conducted concurrently with the Phase 3 clinical trial to satisfy the requirements of the FDA's "Animal Rule". The DoD anticipates that the FDA will approve these products for the Recombinant Botulinum A/B, Plague, and Next Generation Anthrax vaccine programs using the Animal Rule, which allows for the demonstration of efficacy in relevant animal model(s). Upon FDA licensure, the product will transition to full-scale licensed production.

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

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) MCMPT	9.573	3.074	0.199
Description: ADAMANT BOT A/B ***FY 2019 Plans:*** Continue the establishment phase of the ADAMANT platform capability. ***FY 2020 Plans:*** Complete establishment phase of the ADAMANT platform capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 2) JMEDICC	-	-	3.398
Description: Enabling Technologies ***FY 2020 Plans:*** Continue Readiness Activities for OCONUS clinical capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program/project funding transferred from another funding line.			
Title: 3) DoD ADM Support ***Description:*** ADM Infrastructure ***FY 2020 Plans:*** Continue activities to maintain the DoD ADM's capabilities in a state of readiness to support Medical Countermeasure (MCM) development and manufacturing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.	-	-	10.000
Title: 4) CMDR-B ***Description:*** Clinical ***FY 2020 Plans:*** Execute Advanced Development Contract(s) for mature drug products. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Advanced Development.	-	-	8.385
Title: 5) NGDS 2 ***Description:*** Man Portable Diagnostic System (MPDS) ***FY 2019 Plans:*** Continue Engineering & Manufacturing Development for Man Portable Diagnostics System (MPDS). Down-select to one candidate system. ***FY 2020 Plans:*** Continue Engineering & Manufacturing Development, conduct test activities and initiate clinical trials for Man Portable Diagnostics System (MPDS). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule. Initiation of Clinical Trials	18.446	6.124	10.368
Title: 6) NGDS 2 ***Description:*** Chemical Diagnostic (ChemDx)	-	-	2.697

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: Begin Engineering & Manufacturing Development for the Chemical Diagnostic (ChemDx). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.			
Title: 7) DBPAP ***Description:*** Development ***FY 2019 Plans:*** Continued development/expansion of biological threat agents reference materials to known and emerging threats. Continued development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continued QA/QC testing to encompass the transition and fielding of biological detection assays. Continued to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continued quality actions throughout to maintain the quality managed systems. Continued development of prototypes/information for strains contained in Unified Culture Collection. ***FY 2020 Plans:*** Continued development/expansion of biological threat agents reference materials to known and emerging threats. Continued development of assays and nucleic acid based genomic assays to support fielded and developmental systems. Continued QA/QC testing to encompass the transition and fielding of biological detection assays. Continued to maintain yearly accreditation audits such as ISO 9001, 17025, and Guide 34 certifications. Continued quality actions throughout to maintain the quality managed systems. Continued development of prototypes/information for strains contained in Unified Culture Collection. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	8.770	7.917	6.865
Title: 8) DBPAP ***Description:*** Establishment of advanced platform technologies.	6.544	-	-
Title: 9) AV TX ***Description:*** Enabling Technologies ***FY 2019 Plans:*** Non-clinical: Continue efficacy studies with Non Human Primates infected with Ebola virus. ***FY 2020 Plans:***	24.888	5.475	7.095

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Non-clinical: Continue efficacy studies with Non-Human Primates infected with Ebola virus. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to fact of life change in the program/project.			
Title: 10) VAC BOT - Recombinant Botulinum Vaccine ***Description:*** Manufacturing ***FY 2019 Plans:*** Continue manufacturing efforts. ***FY 2020 Plans:*** Continue manufacturing efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule. Decrease due to change in program/project schedule.	19.765	29.758	18.500
Title: 11) VAC BOT - Recombinant Botulinum Vaccine ***Description:*** Non Clinical and Clinical ***FY 2019 Plans:*** Continue non clinical and clinical efforts. ***FY 2020 Plans:*** Continue non clinical and clinical efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.	19.361	4.891	21.999
Title: 12) Cong Mark #230 ***Description:*** Antiviral Prophylaxis Studies ***FY 2019 Plans:*** Continue antiviral prophylaxis studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to fact of life change in the program/project.	5.000	12.000	-
Title: 13) VAC NGA	-	1.385	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: NonClinical ***FY 2019 Plans:*** Conduct and finalize initial species-neutral assay development and qualification to support the anthrax program. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule. Funding not required in FY20.			
Title: 14) VAC PLG ***Description:*** Nonclinical and Clinical ***FY 2019 Plans:*** Continue nonclinical and clinical efforts. ***FY 2020 Plans:*** Continue nonclinical and clinical efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.	11.287	27.427	17.149
Title: 15) VAC PLG ***Description:*** Manufacturing ***FY 2019 Plans:*** Continue manufacturing efforts. ***FY 2020 Plans:*** Continue manufacturing efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.	3.951	17.488	9.807
Title: 16) VAC SIP ***Description:*** Storage, Distribution, Potency Testing ***FY 2019 Plans:***	2.655	1.792	2.765

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program and support product availability for Interim Fielding Capabilities. ***FY 2020 Plans:*** Continue storage, distribution, potency testing, and biosurety compliance activities in support of the Special Immunization Program. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	130.240	117.331	119.227

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	Continuing	Continuing
• JM8788: *NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)*	6.498	6.563	4.905	-	4.905	9.156	8.067	9.064	7.744	Continuing	Continuing
• JX0005: *DOD BIOLOGICAL VACCINE PROCUREMENT (VACCINES)*	0.183	0.183	3.674	-	3.674	22.752	24.735	22.269	32.158	Continuing	Continuing
• JX0210: *DEFENSE BIOLOGICAL PRODUCTS ASSURANCE PROGRAM (DBPAP)*	0.980	0.975	2.961	-	2.961	2.857	2.771	2.747	2.747	Continuing	Continuing

Remarks

D. Acquisition Strategy

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.

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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. Prior to Fiscal Year 2020, this effort was funded under the Antiviral Therapeutics (AV TX) Program. 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. Antiviral Therapeutics program funded JMEDICC effort through FY19.

ADVANCED DEVELOPMENT & MANUFACTURING (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 option is scheduled for completion in 2QFY19, proceeded by a second, 2-year option.

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 initial efficacy. 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. MS B for the program is planned for 4QFY20.

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

The NGDS Increment 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.

The NGDS 2 program addresses CBR agents and COEs that the NGDS 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBR agent diagnostics across multiple echelons of care. 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 initiated prototyping of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. 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 anticipated to be cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings.

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)

The Anti-viral Therapeutics program acquisition strategy supports the development of multiple therapeutics through the Technology Maturation and Risk Reduction (TMRR) phase against the Ebola (Zaire), Marburg, Sudan and alpha virus bio warfare threats. The initial therapeutic candidate is for the Ebola Zaire that is scheduled for a Milestone B decision review in FY19. The overall regulatory approach of the program remains to pursue development of products to FDA approval under the Animal Rule. The program will conduct pilot and pivotal animal efficacy, and toxicology studies for FDA approval. The acquisition strategy for each indication will have the performers submitting New Drug applications for the therapeutics during the Engineering, Manufacturing and Development (EMD) phases.

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. The Low Rate Initial Production (LRIP) decision will be conducted after the manufacturing process has been validated and consistency lots have been produced. A Biologics License Application (BLA) is be submitted to the FDA including all clinical, nonclinical, and manufacturing data. The FDA grants licensure to products that are determined to be safe and efficacious.

CONGRESSIONAL INTEREST ITEMS

CONGRESSIONAL INTEREST ITEM #230
Antiviral prophylaxis studies are being performed. Suitable performers for this type of non-human primate work have been solicited for and the study result will inform potential future studies.

NEXT GENERATION ANTHRAX VACCINE (VAC NGA)

The Next Generation Anthrax vaccine (VAC NGA) program strategy supports the development and qualification of immunological assays and required reference materials to support potential future anthrax vaccine programs. Once qualified, these assays will provide the DOD with data to support future decisions related to the anthrax pre-exposure vaccine program.

PLAGUE VACCINE (VAC PLG)

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

SPECIAL IMMUNIZATION PROGRAM (VAC SIP)

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Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

The SIP effort manages the IND vaccines which provide additional protection to laboratory workers performing research on the infectious agents for Tularemia, Eastern Equine Encephalitis (EEE), Western Equine Encephalitis (WEE), Venezuelan Equine Encephalitis (VEE), Q-Fever and to support product availability for Interim Fielding Capabilities. Efforts include Good Manufacturing Practices (GMP) storage and periodic potency testing to support the FDA regulated Investigational New Drug (IND) reporting requirements. This Department of Defense program supports the Federal interagency with this effort, as well as academic and industry partners.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCMPT - HW S - ADAMANT BOT A/B establishment	C/CPFF	Ology : Alachua, FL	0.000	9.573	Jan 2018	2.187	Jan 2019	0.175	Jan 2020	-		0.175	Continuing	Continuing	0.000
JMEDICC - Readiness	Various	Various : Various	0.000	0.000		0.000		2.369	Nov 2019	-		2.369	Continuing	Continuing	0.000
CMDR-B - Advanced Development Contract	C/CPIF	TBD : TBD	0.000	0.000		0.000		6.303	Oct 2019	-		6.303	Continuing	Continuing	0.000
NGDS - HW C - Man Portable Diagnostic System	C/CPFF	Cepheid : Sunnyvale, CA	0.000	7.165	Jul 2018	4.163	Nov 2018	6.662	Dec 2019	-		6.662	Continuing	Continuing	0.000
NGDS - HW C - Chemical Diagnostic (ChemDx)	C/CPFF	MRI Global : Palm Bay, FL	0.000	0.000		0.000		1.076	Dec 2019	-		1.076	Continuing	Continuing	0.000
NGDS - HW C - Man Portable Diagnostic System #2	C/CPFF	MRI Global : Palm Bay, FL	5.168	5.511	Dec 2017	0.500	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - HW S - ADMAMANT BOT A/B	C/CPFF	20th Support Command : Aberdeen Proving Ground, MD	0.000	6.544		0.000		0.000		-		0.000	Continuing	Continuing	0.000
DBPAP - HW C - Development of Select Biological Threat Agent Reference Materials and Assays	MIPR	Various : Various	0.000	1.826	Mar 2018	1.662	Jun 2019	1.400	Mar 2020	-		1.400	Continuing	Continuing	0.000
AV TX - HW GFPP - Joint Mobile Emerging Disease Intervention Clinical Capability	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	0.804	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - Enabling Technologies (Joint Mobile Emerging Disease Intervention Clinical Capability)	Various	Various : Various	5.124	7.800	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000

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Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AV TX - Gilead Filo Candidate	C/FP	Gilead Sciences : San Francisco, CA	0.000	0.000		5.475	Nov 2018	4.946	Nov 2019	-		4.946	Continuing	Continuing	0.000
VAC BOT - Manufacturing, Validation and Consistency Lot Production	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	38.462	32.756	Dec 2017	27.033	Dec 2018	30.394	Dec 2019	-		30.394	Continuing	Continuing	0.000
CONG - Antiviral prophylaxis studies - OTA	C/FP	TBD : TBD	0.000	2.213	Nov 2018	10.754	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
CONG - Antiviral prophylaxis studies	MIPR	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	2.787	Sep 2018	0.000		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	19.263	11.408	Dec 2017	28.000	Nov 2018	17.549	Dec 2019	-		17.549	Continuing	Continuing	0.000
VAC PLG - HW S - - Manufacturing Validation	MIPR	Battelle Memorial Institute : Columbus, OH	0.200	2.570	Dec 2017	0.553	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	68.217	90.957		80.327		70.874		-		70.874	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ADM - Infrastructure	C/CPFF	Ology : Alachua, FL	0.000	0.000		0.000		8.383	Dec 2019	-		8.383	Continuing	Continuing	0.000
NGDS - ES C - Studies and WIPT Support	MIPR	John Hopkins University : Laurel, MD	0.000	0.000		0.000		0.302	Oct 2019	-		0.302	Continuing	Continuing	0.000
DBPAP - ES C - Select Biological Threat Agent Reference Material Support	MIPR	Various : Various	0.000	1.620	Mar 2018	1.920	Jun 2019	1.500	Mar 2020	-		1.500	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DBPAP - ES C - Select Biological Threat Agent Reference Material Regulatory/Quality Assurance (QA) Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.580	Mar 2018	1.361	Jun 2019	1.482	Mar 2020	-		1.482	Continuing	Continuing	0.000
VAC BOT - Regulatory Integration (Environmental and FDA Documentation) and Delivery System	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	27.728	5.470	Dec 2017	5.136	Dec 2018	1.310	Dec 2019	-		1.310	Continuing	Continuing	0.000
VAC SIP - Storage and Distribution of Vaccines	SS/FP	Fisher BioServices : Rockville, MD	1.323	0.467	Dec 2017	0.437	Feb 2019	0.453	Jan 2020	-		0.453	Continuing	Continuing	0.000
		Subtotal	29.051	9.137		8.854		13.430		-		13.430	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - OTHT C - Test and evaluate interagency	MIPR	Various : Various	0.300	0.060	Jul 2018	0.095	Dec 2018	0.500	Oct 2019	-		0.500	Continuing	Continuing	0.000
NGDS - DTE C - Virus Strain Production & Testing	MIPR	Various : Various	0.000	0.432	Oct 2017	0.250	Nov 2018	0.500	Oct 2019	-		0.500	Continuing	Continuing	0.000
VAC BOT - DTE C - Battelle	Allot	Battelle Memorial Institute : Columbus, OH	0.000	0.900	Dec 2018	1.480	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
VAC BOT - DTE C - T & E Clinical Trials	Allot	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	0.000	0.000		0.000		7.295	Dec 2019	-		7.295	Continuing	Continuing	0.000
VAC BOT - DTE C - Clinical Trials - Nonclinical Studies	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	81.485	0.000		1.000	Dec 2018	1.500	Dec 2019	-		1.500	Continuing	Continuing	0.000
VAC NGA - DTE C - TBD	Various	TBD : TBD	0.000	0.000		1.385	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
VAC PLG - DTE C - Clinical Trials/Non-Clinical Studies	C/CPAF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	91.008	0.806	Dec 2017	3.920	Dec 2018	9.407	Dec 2019	-		9.407	Continuing	Continuing	0.000
VAC PLG - DTE C - USAMRIID T&E	Allot	US Army Medical Research Institute of Infectious Disease (USAMRIID) : Fort Detrick, MD	0.000	0.294	Dec 2018	0.000		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	10.269	1.834	Dec 2017	1.000	Dec 2019	2.170	Jan 2020	-		2.170	Continuing	Continuing	0.000
		Subtotal	183.062	4.326		9.130		21.372		-		21.372	Continuing	Continuing	N/A

Remarks

Rate of program activities has decreased while the current CONOPS and capability are assessed by the Services.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCMPT - PM/MS C - Program Management	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.388	Dec 2018	0.024	Dec 2019	-		0.024	Continuing	Continuing	0.000
MCMPT - PM/MS C - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	0.000		0.499	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JMEDICC - PM/MS SB - Management Support	C/FP	Various : Various	0.000	0.000		0.000		0.370	Feb 2020	-		0.370	Continuing	Continuing	0.000
JMEDICC - PM/MS SB - JPEO	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.246	Jan 2020	-		0.246	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JMEDICC - PM/MS SB - Management Support #2	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.224	Jan 2020	-		0.224	Continuing	Continuing	0.000
JMEDICC - PM/MS SB - - Management Support	Allot	JPM Medical Countermeasures Systems (JPM MCS) : BioDefense Therapeutics, Frederick, MD	0.000	0.000		0.000		0.189	Jan 2020	-		0.189	Continuing	Continuing	0.000
ADM - PM/MS C - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.700	Dec 2019	-		0.700	Continuing	Continuing	0.000
ADM - PM/MS C - Program Management Support #2	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.000	0.000		0.000		0.917	Dec 2019	-		0.917	Continuing	Continuing	0.000
CMDR-B - PM/MS S - Program Management/ Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.608	Jan 2020	-		0.608	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.553	Jan 2020	-		0.553	Continuing	Continuing	0.000
CMDR-B - PM/MS SB - Contractor Systems Engineering/Program Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Belvoir, VA	0.000	0.000		0.000		0.921	Jan 2020	-		0.921	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - PM/MS S - Product Management Support	MIPR	Various : Various	2.938	0.068	Oct 2017	0.871	Nov 2018	1.887	Dec 2019	-		1.887	Continuing	Continuing	0.000
NGDS - PM/MS C - Program Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.170	Nov 2018	0.329	Dec 2019	-		0.329	Continuing	Continuing	0.000
NGDS - PM/MS S - Product Management Support #2	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	4.425	4.460	Dec 2017	0.075	Dec 2018	0.947	Dec 2019	-		0.947	Continuing	Continuing	0.000
NGDS - PM/MS SB - Product Management Systems Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.686	0.750	Dec 2017	0.000		0.862	Dec 2019	-		0.862	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Contractor Support	SS/FFP	Various : Various	0.000	1.123	Feb 2018	0.849	Feb 2019	0.860	Feb 2020	-		0.860	Continuing	Continuing	0.000
DBPAP - PM/MS C - Product Management Support	Allot	JPM Guardian : Aberdeen Proving Ground, MD	0.000	2.621	Jan 2018	2.125	Jan 2019	1.623	Jan 2020	-		1.623	Continuing	Continuing	0.000
AV TX - PM/MS - S - Program Management/ Program Manager Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	2.432	6.551	Jan 2018	0.000		0.514	Jan 2020	-		0.514	Continuing	Continuing	0.000
AV TX - PM/MS SB -	C/CPFF	Ology : Alachua, FL	0.000	6.564	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
AV TX - PM/MS - SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.326	1.478	Jan 2018	0.000		0.468	Jan 2020	-		0.468	Continuing	Continuing	0.000
AV TX - PM/MS - S - Management Support	Allot	JPM Medical Countermeasure Systems (JPM	0.000	0.304	Jan 2018	0.000		0.395	Jan 2020	-		0.395	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		MCS) : Fort Belvoir, VA													
AV TX - PM/MS - SB - Management Support #2	C/FP	Various : Various	2.051	1.387	Jan 2018	0.000		0.772	Jan 2020	-		0.772	Continuing	Continuing	0.000
CONG - PM/MS SB - Management Support	Allot	JPM Chem/Bio Medical Systems (JPM CBMS) : Fort Detrick, MD	0.000	0.000		0.220	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
CONG - PM/MS SB - Contractor Systems Engineering/Program Management Support	Allot	Various : Various	0.000	0.000		1.026	Nov 2019	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - PM/MS S - Joint Vaccine Acquisition Program Management Office	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	25.636	0.150	Dec 2017	1.428	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - PM/MS S - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	42.923	0.010	Dec 2017	4.517	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
VAC PLG - ADMC Support	C/CPFF	Ology : Alachua, FL	1.800	0.000		6.497	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
VAC SIP - PM/MS SB - Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.215	0.300	Mar 2018	0.355	Mar 2019	0.142	Mar 2020	-		0.142	Continuing	Continuing	0.000
VAC SIP - SBIR/STTR - SBIR/STTR Tax	Allot	USA Research Dev & Engr Cmd (RDECOM) : Aberdeen Proving Ground, MD	0.000	0.054	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	88.432	25.820		19.020		13.551		-		13.551	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	368.762	130.240		117.331		119.227		-		119.227	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

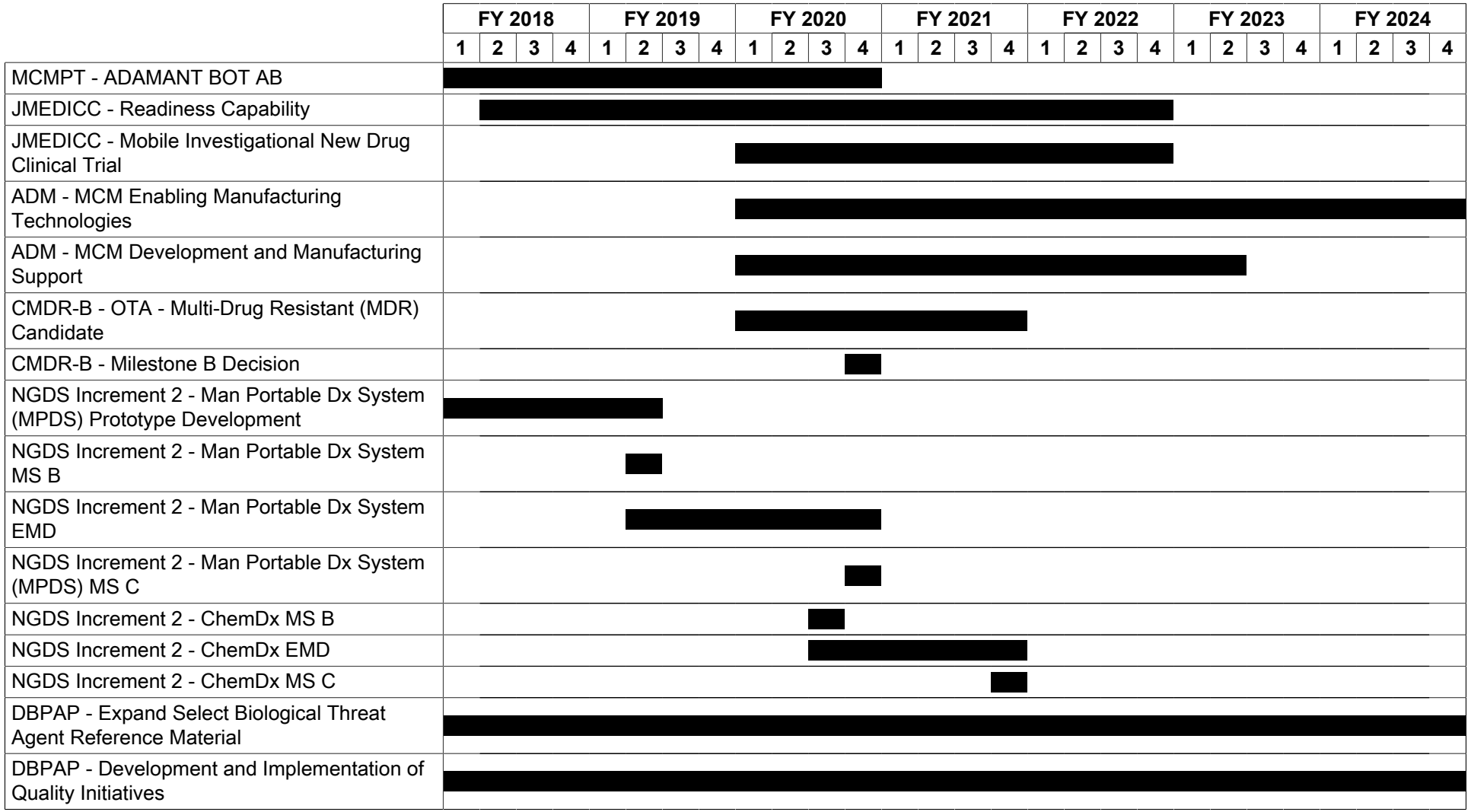

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

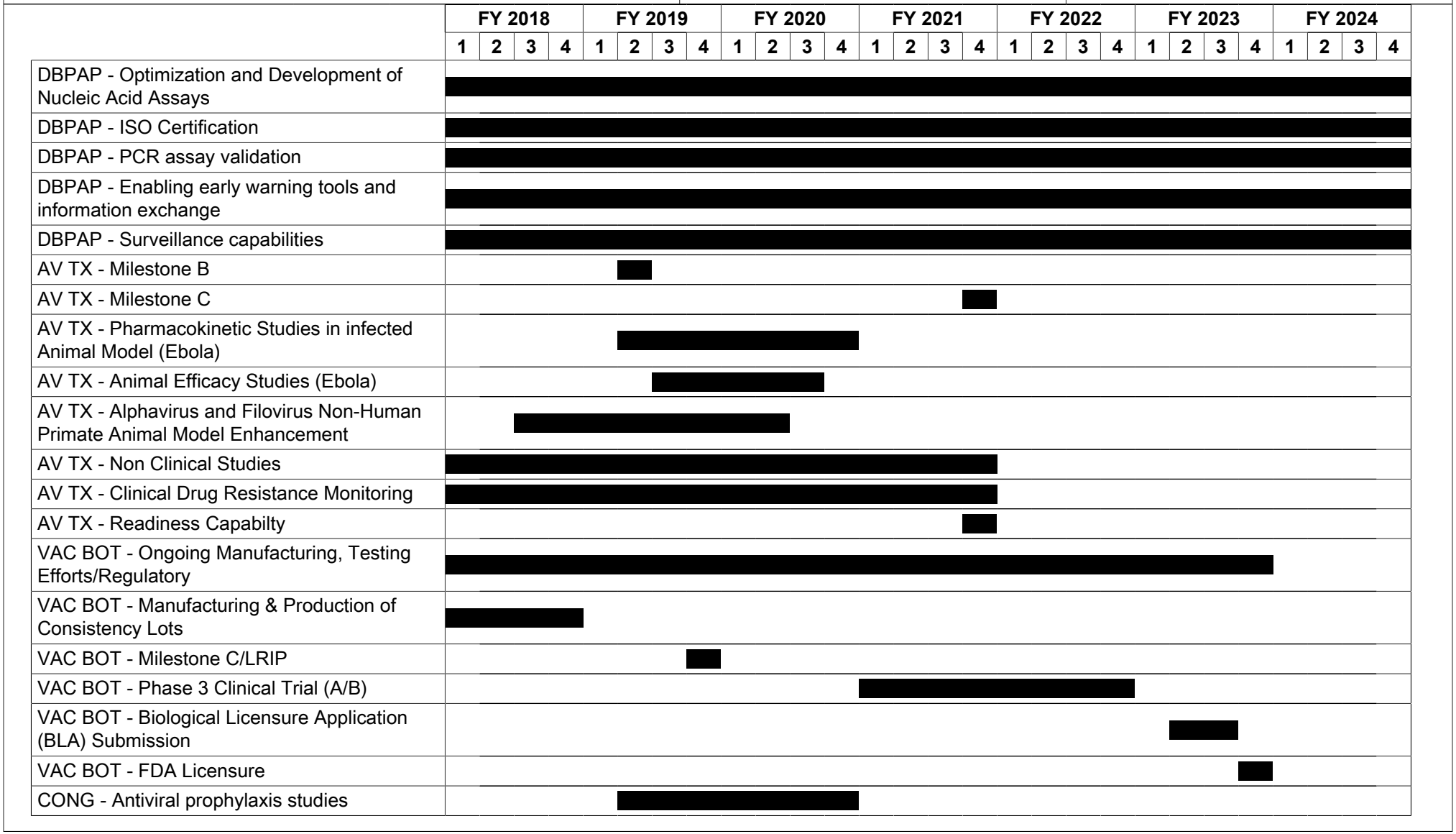

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

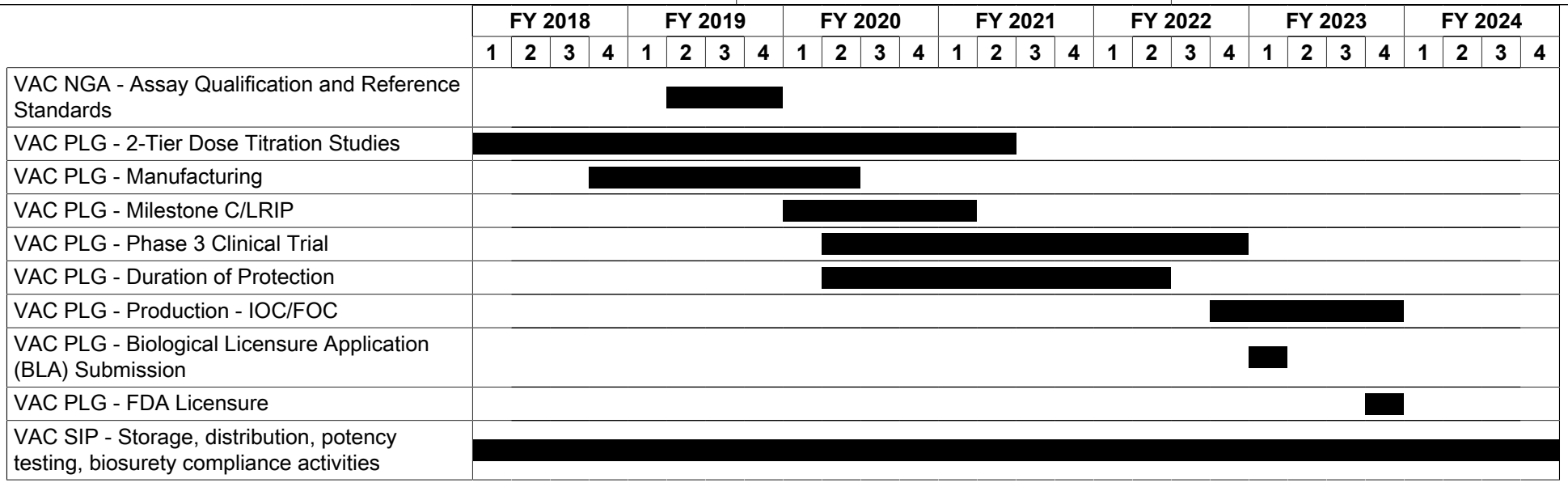

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MCMPT - ADAMANT BOT AB	1	2018	4	2020
JMEDICC - Readiness Capability	2	2018	4	2022
JMEDICC - Mobile Investigational New Drug Clinical Trial	1	2020	4	2022
ADM - MCM Enabling Manufacturing Technologies	1	2020	4	2024
ADM - MCM Development and Manufacturing Support	1	2020	2	2023
CMDR-B - OTA - Multi-Drug Resistant (MDR) Candidate	1	2020	4	2021
CMDR-B - Milestone B Decision	4	2020	4	2020
NGDS Increment 2 - Man Portable Dx System (MPDS) Prototype Development	1	2018	2	2019
NGDS Increment 2 - Man Portable Dx System MS B	2	2019	2	2019
NGDS Increment 2 - Man Portable Dx System EMD	2	2019	4	2020
NGDS Increment 2 - Man Portable Dx System (MPDS) MS C	4	2020	4	2020
NGDS Increment 2 - ChemDx MS B	3	2020	3	2020
NGDS Increment 2 - ChemDx EMD	3	2020	4	2021
NGDS Increment 2 - ChemDx MS C	4	2021	4	2021
DBPAP - Expand Select Biological Threat Agent Reference Material	1	2018	4	2024
DBPAP - Development and Implementation of Quality Initiatives	1	2018	4	2024
DBPAP - Optimization and Development of Nucleic Acid Assays	1	2018	4	2024
DBPAP - ISO Certification	1	2018	4	2024
DBPAP - PCR assay validation	1	2018	4	2024
DBPAP - Enabling early warning tools and information exchange	1	2018	4	2024
DBPAP - Surveillance capabilities	1	2018	4	2024
AV TX - Milestone B	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MB5 / *MEDICAL BIOLOGICAL DEFENSE (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AV TX - Milestone C	4	2021	4	2021
AV TX - Pharmacokinetic Studies in infected Animal Model (Ebola)	2	2019	4	2020
AV TX - Animal Efficacy Studies (Ebola)	3	2019	3	2020
AV TX - Alphavirus and Filovirus Non-Human Primate Animal Model Enhancement	3	2018	2	2020
AV TX - Non Clinical Studies	1	2018	4	2021
AV TX - Clinical Drug Resistance Monitoring	1	2018	4	2021
AV TX - Readiness Capabilty	4	2021	4	2021
VAC BOT - Ongoing Manufacturing, Testing Efforts/Regulatory	1	2018	4	2023
VAC BOT - Manufacturing & Production of Consistency Lots	1	2018	4	2018
VAC BOT - Milestone C/LRIP	4	2019	4	2019
VAC BOT - Phase 3 Clinical Trial (A/B)	1	2021	4	2022
VAC BOT - Biological Licensure Application (BLA) Submission	2	2023	3	2023
VAC BOT - FDA Licensure	4	2023	4	2023
CONG - Antiviral prophylaxis studies	2	2019	4	2020
VAC NGA - Assay Qualification and Reference Standards	2	2019	4	2019
VAC PLG - 2-Tier Dose Titration Studies	1	2018	2	2021
VAC PLG - Manufacturing	4	2018	2	2020
VAC PLG - Milestone C/LRIP	1	2020	1	2021
VAC PLG - Phase 3 Clinical Trial	2	2020	4	2022
VAC PLG - Duration of Protection	2	2020	2	2022
VAC PLG - Production - IOC/FOC	4	2022	4	2023
VAC PLG - Biological Licensure Application (BLA) Submission	1	2023	1	2023
VAC PLG - FDA Licensure	4	2023	4	2023
VAC SIP - Storage, distribution, potency testing, biosurety compliance activities	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 5					R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*				Project (Number/Name) MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
MC5: *MEDICAL CHEMICAL DEFENSE (EMD)*	-	58.419	57.545	62.051	-	62.051	64.331	56.641	28.559	26.976	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 the project are:
(1) Emerging Threats (EMRT)
(2) Alternative Autoinjector (AUTOINJ)
(3) Advanced Anticonvulsant System (AAS)
(4) Bioscavenger - Plasma (BSCAV-P)
(5) The Improved Nerve Agent Treatment System (INATS)

The EMRT program is now referred to as the Rapid Opioid Countermeasure System (ROCS) and 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.

AUTOINJ consists of investigating an FDA approved alternative source(s), beyond the single current DoD source, for autoinjectors that deliver DoD nerve agent antidote and treatment capabilities to the warfighter; mitigates capability fielding and operational readiness risks. This resulted from the manufacturing and quality issues for the fielded ATNAA product, the oxime (2-PAM) and atropine in a dual chambered autoinjector.

The 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.

The BSCAV-P is a new capability, to be used as a prophylaxis against nerve agents.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

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 effort include (1) a new and improved oxime (replacing 2-pralidoxime chloride (2-PAM) to treat current and emerging threats and 2) the insertion of a Centrally-Acting (CA) anticholinergic agent to the treatment regimen to increase survivability and decrease morbidity. Based on recent guidance from the FDA there is no longer a need to expand the pretreatment indications for pyridostigmine bromide beyond the nerve agent soman. Therefore, the Joint Project Manager for Chemical Defense Pharmaceuticals (JPdM CDP) will execute nonclinical studies to demonstrate the safety of pyridostigmine bromide when used as a pretreatment should agents other than soman be encountered. This is no longer a BA5 but BA7 work effort. 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 2018	FY 2019	FY 2020
Title: 1) Rapid Opioid Countermeasure System (ROCS) ***Description:*** Manufacturing ***FY 2020 Plans:*** Initiate manufacturing activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred from another funding line. Program is changing names from EMRT.	-	-	6.166
Title: 2) Rapid Opioid Countermeasure System (ROCS) ***Description:*** Clinical Studies ***FY 2020 Plans:*** Initiate Phase 1 human clinical studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred from another funding line. Program is changing names from EMRT.	-	-	5.269
Title: 3) Rapid Opioid Countermeasure System (ROCS) ***Description:*** Development ***FY 2020 Plans:*** Initiate naloxone formulation studies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred from another funding line. Funding transferred from EMRT, Project Medical Chemical Defense, Budget Activity 4 (MC4) starting in FY20.	-	-	2.304
Title: 4) AUTOINJ	2.896	1.000	4.800

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Manufacturing ***FY 2019 Plans:*** Continue manufacturing of autoinjector consistency lots. ***FY 2020 Plans:*** Complete manufacturing of autoinjector consistency lots; initiate prototype tooling for dual chambered autoinjector; initiate manufacturing, validation for dual chamber auto-injector ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 5) AUTOINJ ***Description:*** Testing ***FY 2019 Plans:*** Continue storage stability and bioequivalency testing for atropine, 2PAM, diazepam & dual drug delivery autoinjectors. Initiate reliability, Human Factors, and stability studies for atropine.Continue prototype development of single autoinjector. ***FY 2020 Plans:*** Complete reliability, HF, continue stability studies for atropine. Initiate functional testing for dual chamber auto injector. Continue prototype development of single autoinjector. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	11.598	8.605	17.000
Title: 6) AUTOINJ ***Description:*** FDA ***FY 2019 Plans:*** Continue FDA preparation, filing, and meetings for single and dual drug autoinjectors. ***FY 2020 Plans:*** Continue FDA preparation, filing, and meetings for single and dual drug autoinjectors. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	2.183	0.500	2.068

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to change in program/project technical parameters.			
Title: 7) AUTOINJ ***Description:*** Clinical ***FY 2019 Plans:*** Continue human factors and environmental testing for single and dual drug autoinjectors. ***FY 2020 Plans:*** Continue human factors and environmental testing for single and dual drug autoinjectors.	2.651	1.000	1.000
Title: 8) AAS ***Description:*** NDA Resubmission ***FY 2019 Plans:*** NDA resubmission activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.	-	9.640	-
Title: 9) BSCAV-P ***Description:*** Non-Clinical	9.889	-	-
Title: 10) BSCAV-P ***Description:*** Manufacturing ***FY 2019 Plans:*** Continue cGMP manufacturing for the current product batch. ***FY 2020 Plans:*** Complete cGMP manufacturing for the current product batch. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	15.519	23.001	0.500
Title: 11) INATS - Scopolamine ***Description:*** Manufacturing & Non-Clinical & Clinical	13.683	13.799	2.810

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Initiate manufacturing activities and non-clinical studies. ***FY 2020 Plans:*** Initiate clinical efforts and continue manufacturing and non-clinical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.			
Title: 12) INATS - Oxime ***Description:*** Non-Clinical, Clinical & Manufacturing ***FY 2020 Plans:*** Continue non-clinical trials. Initiate manufacturing and clinical efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Engineering and Manufacturing Development Phase.	-	-	20.134
Accomplishments/Planned Programs Subtotals	58.419	57.545	62.051

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JM6677: *ADVANCED ANTICONVULSANT SYSTEM (AAS)*	0.000	0.360	5.352	-	5.352	2.696	2.694	3.991	0.000	0.000	15.093

Remarks

D. Acquisition Strategy

RAPID OPIOID COUNTERMEASURE SYSTEM (ROCS)

The Emerging Threats program is now called the Rapid Opioid Countermeasure System (ROCS). The ROCS program is considering existing naloxone autoinjector capabilities identified from focused Market Research and Small Business Innovative Research and Small Business Technology Transfer (SBIR/STTR) information to rapidly transition a candidate into advanced development and future production and fielding. ROCS is also considering, with the joint service users, an accelerated requirements and acquisition structure. Other Transaction Authority (OTA) Agreements will be utilized to the extent possible in the development.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

ALTERNATE AUTOINJECTOR MANUFACTURER CAPABILITY (AUTOINJ)

The Alternative Autoinjector Investigation will identify an alternative source(s) to develop, and provide required and FDA approved autoinjector-delivered nerve agent antidote and treatment capabilities to the services. Currently, a single DoD source provides all of these capabilities. That single source is experiencing manufacturing and quality issues leading to risk that the services may not meet their operational requirements. This effort leverages previous work begun under the Advanced Anticonvulsant System (AAS) autoinjector-delivered product wherein the single manufacturer notified the AAS program office that the FDA had noted manufacturing and quality issues which impacted the AAS program as well as all other DoD autoinjector-delivered nerve agent antidotes and treatments. At that time, the AAS program began investigating alternative sources through the release of a RFI. Subsequent to the RFI, the AAS program awarded a task order under an existing IDIQ contract vehicle to begin the identification efforts. As this issue is well beyond the scope of the AAS program and impacts all developmental and fielded autoinjector-delivered capabilities, the Joint Program Executive Office, Chemical and Biological Defense (JPEO-CBD) approved the strategy to expand the alternative autoinjector effort beyond AAS, thus initiating a new effort benefiting both fielded and developmental capabilities. The JPEO-CBD also approved the management and oversight of the effort via a series of In-Process Reviews (IPRs). The effort will proceed through the submission of a New Drug Application and will culminate with FDA approval of an alternative autoinjector source(s).

ADVANCED ANTICONVULSANT SYSTEM (AAS)

The Advanced Anticonvulsant System, consists of Midazolam in an autoinjector for treatment of nerve agent induced seizures. Midazolam, injected intramuscularly, will treat traditional nerve agent and non-traditional nerve agent-induced seizures and prevent subsequent neurological damage. Midazolam is more water-soluble than diazepam (the currently fielded medication to control nerve agent-induced seizures) and terminates nerve agent-induced seizures more quickly than diazepam. AAS will not eliminate the need for other protective and therapeutic systems.

A contractor shall be responsible for conducting activities associated with drug development in a manner consistent with eventual approval by the Food and Drug Administration (FDA). The contractor shall sponsor the drug to the FDA and hold all approvals and/or licenses. During the System Development and Demonstration (SDD) Phase, large scale manufacturing, Phase 2 human clinical safety studies and definitive animal efficacy studies will be conducted. FDA approval of the countermeasure is an exit criterion for the SDD phase. During the Production and Deployment Phase, sufficient quantities of product to meet Initial Operational Capability will be purchased. Subsequent purchases will be made by the Defense Logistics Agency. Any post-marketing surveillance requested by the FDA will be the responsibility of the contractor.

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 current licensure activity in FY20. In FY20, the program will obtain the technical data package and intellectual property from the contractor in order to continue future

development of the same or similar product. The program will continue with the ongoing collaborations with the international partners under the Chemical, Biological, and Radiological Memorandum of Understanding (CBR-MOU) to develop a treatment indication for Bioscavenger. The Bioscavenger program will also conduct an analysis of alternative manufacturing technologies, continue to evaluate alternative candidates, and monitor technologies that may lead to a full force solution.

IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

Oxime Component - The development of a new and improved oxime, MMB4, (replacing 2-PAM) to treat current and emerging nerve agent threats, is one component of the INATS Development Program. Both the oxime and the centrally acting components are required to address the current and emerging nerve agent threat and to mitigate their effects. MMB4 is a relatively new chemical entity transitioning from Science and Technology Development. MMB4 requires the conduct of studies to resume the Phase 1 Clinical Trial, preparation for the Phase 2 clinical trials, the manufacturing of the drug product for both these trials, the conduct of non-clinical studies to determine toxicity, and the conduct of premonitory studies to determine the impact of nerve transmissions.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ROCS - 1. Initiate naloxone formulation studies	C/CPFF	TBD : TBD	0.000	0.000		0.000		1.860	Nov 2019	-		1.860	Continuing	Continuing	0.000
ROCS - 2. Initiate development of autoinjector and large scale manufacturing process	C/CPFF	TBD : TBD	0.000	0.000		0.000		4.979	Feb 2020	-		4.979	Continuing	Continuing	0.000
ROCS - 4. Initiate Human clinical studies	C/CPFF	TBD : TBD	0.000	0.000		0.000		4.255	Aug 2020	-		4.255	Continuing	Continuing	0.000
AUTOINJ - HW S - Autoinjector - Manufacturing of Consistency Lots	C/CPFF	Battelle Memorial Institute : Columbus, OH	2.236	1.262	Dec 2017	0.353	Dec 2018	3.000	Dec 2019	-		3.000	Continuing	Continuing	0.000
AUTOINJ - HW C - Prototype Development	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	1.785	Oct 2017	0.250	Nov 2018	4.343	Nov 2019	-		4.343	Continuing	Continuing	0.000
AUTOINJ - HW C - Dual Drug Delivery Device (D4) Prototype Development	C/CPFF	Emergent Biosolutions : Gaithersburg/ Rockville, MD	0.500	8.698	Dec 2017	5.000	Nov 2018	5.213	Nov 2019	-		5.213	Continuing	Continuing	0.000
AAS - SW C - Resubmission of NDA	C/CPIF	Meridian Medical Technologies Inc. : Columbia, MD	1.630	0.000		6.181	Jan 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	35.738	10.944	Jan 2018	14.492	Jan 2019	0.500		-		0.500	Continuing	Continuing	0.000
INATS - HW C - Large-Scale Manufacturing	C/CPFF	TBD : TBD	0.000	0.000		0.000		3.033	Nov 2020	-		3.033	Continuing	Continuing	0.000
INATS - HW C - Animal Efficacy Studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		2.888	Nov 2020	-		2.888	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
INATS - HW C - Oxime & Centrally-Acting AutoInjector Efforts	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		0.000		8.352	Nov 2020	-		8.352	Continuing	Continuing	0.000
INATS - HW C - Scopolamine cGMP Efforts and Manufacture of Material	C/CPFF	Various : Various	7.439	1.904	Dec 2017	3.000	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
INATS - HW C - Reformulation Efforts & Bridging Studies	C/CPFF	Various : Various	0.000	4.972	Oct 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	47.543	29.565		29.276		38.423		-		38.423	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AUTOINJ - TD/D S - Autoinjector - FDA NDA coordination	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.190	0.165	Oct 2017	0.200	Nov 2018	4.868	Nov 2019	-		4.868	Continuing	Continuing	0.000
INATS - ILS S - Regulatory Support	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.924	0.086	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	1.114	0.251		0.200		4.868		-		4.868	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AUTOINJ - DTE S - Autoinjector - Stability Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	1.760	1.449	Oct 2017	0.500	Nov 2018	3.000	Nov 2019	-		3.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AUTOINJ - DTE C - Human Factors Testing	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.795	Oct 2017	0.313	Nov 2018	1.000	Nov 2019	-		1.000	Continuing	Continuing	0.000
BSCAV-P - OTHT S - Nonclinical Studies to evaluate drug-drug interactions	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	1.870	1.471	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - OTHT S - Pilot Nonclinical PK Efficacy Studies	C/CPFF	DynPort Vaccine Company (DVC) LLC. : Frederick, MD	14.003	4.990	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - DTE S - Oxime Phase 2 Clinical Trials	C/CPFF	TBD : TBD	0.000	0.000		0.000		2.292	Nov 2020	-		2.292	Continuing	Continuing	0.000
INATS - DTE S - Scopolamine Centrally Acting Phase 1 Clinical Trial	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		2.000	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
INATS - DTE S - Scopolamine Centrally Acting Animal & Efficacy Studies	C/CPFF	Battelle Memorial Institute : Columbus, OH	0.000	0.000		3.034	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
INATS - DTE S - Centrally Acting Phase 2 Trial	C/CPFF	Various : Various	2.240	0.000		0.000		2.140	Nov 2020	-		2.140	Continuing	Continuing	0.000
		Subtotal	19.873	8.705		5.847		8.432		-		8.432	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ROCS - PM/MS C - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.996	Nov 2019	-		0.996	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ROCS - PM/MS C - Product Management	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.000		0.907	Nov 2019	-		0.907	Continuing	Continuing	0.000
ROCS - PM/MS C - ADMC Support	PO	Ology : Alachua, FL	0.000	0.000		0.000		0.742	Nov 2019	-		0.742	Continuing	Continuing	0.000
AUTOINJ - PM/MS C - Autoinjector - Program Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	1.277	Dec 2017	1.622	Dec 2018	1.803	Dec 2019	-		1.803	Continuing	Continuing	0.000
AUTOINJ - PM/MS C - Autoinjector - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	3.661	Dec 2017	2.221	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
AUTOINJ - PM/MS S - Autoinjector - Product Support	PO	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.358	0.236	Dec 2017	0.000		1.641	Nov 2019	-		1.641	Continuing	Continuing	0.000
AUTOINJ - PM/MS C - OPETS	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.646	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
AAS - PM/MS C - OPETS	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.527	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
AAS - PM/MS C - Medical Countermeasure Systems (MCS)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	1.727	0.000		1.600	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AAS - PM/MS C - MCS Federal Pay	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.190	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
AAS - PM/MS S - Program Management Support	PO	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.370	0.000		1.142	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS S - MCS Management Support	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	5.943	1.031	Mar 2018	3.481	Mar 2019	0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS C - Federal Pay	Allot	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	0.000	0.000		0.775	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS C - BSCAV - ADMC Support	PO	Ology : Alachua, FL	0.000	3.080	Dec 2017	0.300	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS S - Product Management Support (OPETS)	C/FFP	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	5.779	1.210	Jun 2018	1.054	Jun 2019	0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS S - Product Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.636	0.240	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
BSCAV-P - PM/MS C - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	6.559	2.442	Mar 2018	2.899	Mar 2019	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
INATS - PM/MS S - Product Management Support (OHD)	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	2.435	3.828	Dec 2017	3.786	Dec 2018	2.576	Dec 2019	-		2.576	Continuing	Continuing	0.000
INATS - PM/MS S - ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	1.401	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
INATS - PM/MS S - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	1.478	1.492	Mar 2018	1.979	Dec 2018	1.663	Mar 2020	-		1.663	Continuing	Continuing	0.000
		Subtotal	26.285	19.898		22.222		10.328		-		10.328	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	94.815	58.419		57.545		62.051		-		62.051	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

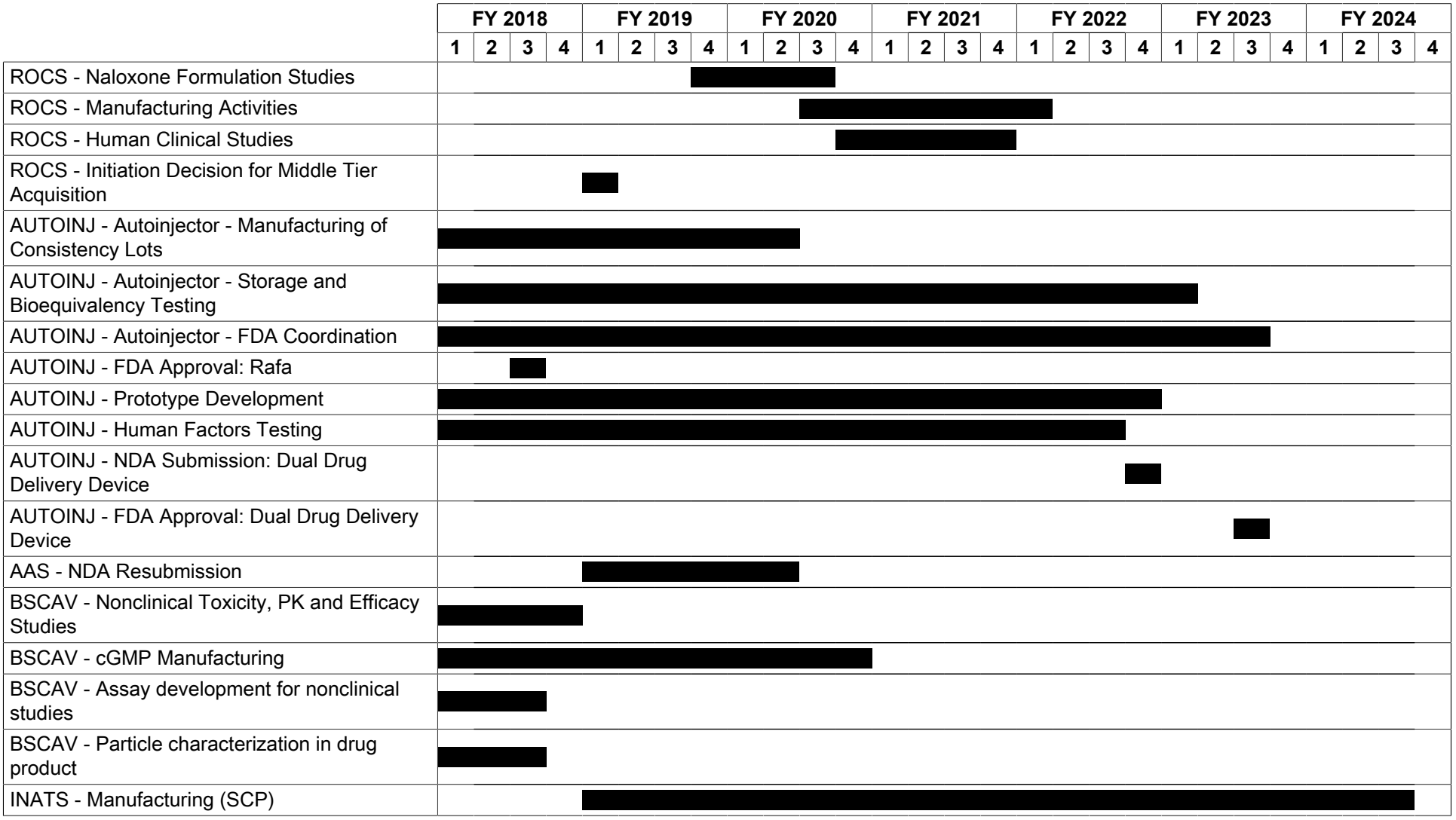

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

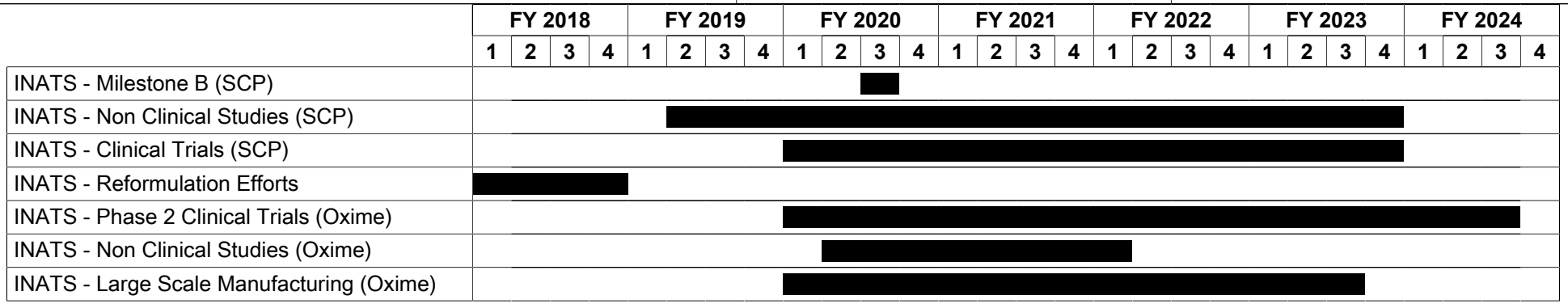

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ROCS - Naloxone Formulation Studies	4	2019	3	2020
ROCS - Manufacturing Activities	3	2020	1	2022
ROCS - Human Clinical Studies	4	2020	4	2021
ROCS - Initiation Decision for Middle Tier Acquisition	1	2019	1	2019
AUTOINJ - Autoinjector - Manufacturing of Consistency Lots	1	2018	2	2020
AUTOINJ - Autoinjector - Storage and Bioequivalency Testing	1	2018	1	2023
AUTOINJ - Autoinjector - FDA Coordination	1	2018	3	2023
AUTOINJ - FDA Approval: Rafa	3	2018	3	2018
AUTOINJ - Prototype Development	1	2018	4	2022
AUTOINJ - Human Factors Testing	1	2018	3	2022
AUTOINJ - NDA Submission: Dual Drug Delivery Device	4	2022	4	2022
AUTOINJ - FDA Approval: Dual Drug Delivery Device	3	2023	3	2023
AAS - NDA Resubmission	1	2019	2	2020
BSCAV - Nonclinical Toxicity, PK and Efficacy Studies	1	2018	4	2018
BSCAV - cGMP Manufacturing	1	2018	4	2020
BSCAV - Assay development for nonclinical studies	1	2018	3	2018
BSCAV - Particle characterization in drug product	1	2018	3	2018
INATS - Manufacturing (SCP)	1	2019	3	2024
INATS - Milestone B (SCP)	3	2020	3	2020
INATS - Non Clinical Studies (SCP)	2	2019	4	2023
INATS - Clinical Trials (SCP)	1	2020	4	2023
INATS - Reformulation Efforts	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** MC5 / *MEDICAL CHEMICAL DEFENSE (EMD)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
INATS - Phase 2 Clinical Trials (Oxime)	1	2020	3	2024
INATS - Non Clinical Studies (Oxime)	2	2020	1	2022
INATS - Large Scale Manufacturing (Oxime)	1	2020	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) TE5 / *TEST & EVALUATION (EMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TE5: *TEST & EVALUATION (EMD)*	-	14.532	9.056	7.775	-	7.775	7.975	7.377	7.376	7.375	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The project identifies critical test capabilities, planning, and infrastructure improvements/modifications necessary to evaluate CBRN Defense systems in realistic operating environments.

Efforts included in this project are:
(1) Product Director, Test, Equipment, Strategy, and Support (PD TESS)
(2) Chemical Biological Material Assessment Infrastructure (CBMAI)

PD TESS and CBMAI determine test infrastructure needs across the Chemical Biological Defense Portfolio (CBDP) and prioritizes RDT&E resources to support test planning and schedules/milestones for programs of record. Infrastructure improvements, modifications, or new development provide critical test capabilities for chemical, biological, and emerging threat products. CBMAI conducts studies and prototyping to enable rapid integration to support testing of detection, protection, and decontamination equipment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) PD TESS ***Description:*** Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners.	3.108	-	-
Title: 2) PD TESS ***Description:*** PD TESS provides test infrastructure upgrades 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 improvements, upgrades, and modernization efforts allow test facilities to expand productivity and reduce costs while providing critical test data.	11.424	-	-
Title: 3) CBMAI ***Description:*** CBMAI provides test infrastructure upgrades and integration to address detection, protection, and decontamination requirements and milestone schedules. Provide analysis and testing of innovative technologies and rapid prototyping of	-	6.629	4.744

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
equipment to expedite the infrastructure development process. Execution of improvements, upgrades, and modernization efforts allow test facilities to expand productivity and reduce costs while providing critical test data. ***FY 2019 Plans:*** Complete implementation of upgrades to NTA infrastructure to meet POR test requirements. Complete implementation of CBRN training facility enhancements and reopen facility for soldier training. Continue validation of aerosol biological agent chamber at Dugway and transition to ECBC. Continued integration of data management upgrades. Complete transition of Chem/Bio outdoor test range (Test Grid) to Dugway. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 4) CBMAI ***Description:*** Government Integrated Product Team program management and IPT Support to all JPEO programs and external partners. ***FY 2019 Plans:*** Initiate Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2020 Plans:*** Continue Program Management including Government system engineering, program/financial management, costing, personnel support, travel and overhead. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	2.427	3.031
Accomplishments/Planned Programs Subtotals	14.532	9.056	7.775

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• TE7: *TEST & EVALUATION (OP SYS DEV)*	6.475	6.318	5.403	-	5.403	5.720	5.716	5.716	5.716	Continuing	Continuing

Remarks

D. Acquisition Strategy

TEST EQUIPMENT, STRATEGY & SUPPORT (PD TESS)

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

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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) TE5 / *TEST & EVALUATION (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD TESS - HW S - Chemical Defense Training Facility (CDTF) Enhancements	C/CPFF	MRIGlobal : Kansas City, MO	0.000	4.500	Jun 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW C - Product Contractor Development Team	C/FFP	Patricio Enterprises : Inc., Woodbridge, VA	0.000	0.215	Feb 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - Test Infrastructure - HWS - NTA Defense Test System Design/Fabrication/ Installation	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	3.598	0.930	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Test Grid	C/CPFF	MRIGlobal : Kansas City, MO	0.000	1.395	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Test Grid #2	C/CPFF	Harris : Inc, Herdnon, VA	0.754	0.859	Apr 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - Test Infrastructure - HW S - Test Grid	MIPR	Various : Various	0.608	0.088	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - JABT Component Upgrades	C/CPFF	MRIGlobal : Kansas City, MO	0.000	1.385	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - JABT Component Upgrades #2	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.204	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Open Architecture Data Management System (OADMS)	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.045	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Open Architecture Data Management System (OADMS) #2	C/CPFF	MRIGlobal : Kansas City, MO	0.000	1.044	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Chemical Defense	MIPR	Edgewood Chemical Biological Center	0.000	0.309	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 5	R-1 Program Element (Number/Name) PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	Project (Number/Name) TE5 / *TEST & EVALUATION (EMD)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Facility (CDTF) Enhancements #2		(ECBC) : Aberdeen Proving Ground, MD													
PD TESS - Test Infrastructure - HW S - WSLAT	MIPR	West Desert Test Center : Dugway, UT	0.436	0.147	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Integrated Early Warning	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.518	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
PD TESS - HW S - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	1.050	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Joint Ambiant Breeze Tunnel (JABT)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.194	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - SW C - Open Architecture Data Management Systems (OADMS)	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.156	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - SW S - Test Grid Transition Activities	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.147	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Chemical Defense Training Facility (CDTF) Enhancements	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.426	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Test Grid	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		1.242	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBMAI - HW S - Upgrades, V&V, Transition	Various	Various : Various	0.000	0.000		0.000		1.000	Dec 2019	-		1.000	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	0.000		0.300	Nov 2018	0.270	Jan 2020	-		0.270	Continuing	Continuing	0.000
CBMAI - HW S - Open Architecture Data	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		2.641	Dec 2018	1.100	Dec 2019	-		1.100	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management System (OADMS) Software Modifications															
CBMAI - HW S - Ballistic Gas Chromatograph (GC)	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.286	Dec 2018	1.474	Dec 2019	-		1.474	Continuing	Continuing	0.000
CBMAI - HW S - Government SE & Technical Management Team	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		1.131	Dec 2018	1.538	Nov 2019	-		1.538	Continuing	Continuing	0.000
		Subtotal	5.396	12.689		6.523		5.382		-		5.382	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBMAI - OTHT C - JABT Support	MIPR	Dugway Proving Ground (DPG) : Dugway, UT	0.000	0.000		0.042	Jan 2019	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		0.500	Jan 2019	0.400	Dec 2019	-		0.400	Continuing	Continuing	0.000
CBMAI - OTE S - Test Grid Sustainment	C/CPFF	MRIGlobal : Kansas City, MO	0.000	0.000		0.659	Feb 2019	0.500	Dec 2019	-		0.500	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		1.201		0.900		-		0.900	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD TESS - PD TESS - PM/MS S - IPT Support/ Program Management	MIPR	JPEO Chem/Bio Defense (JPEO-	10.078	1.735	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		CBD) : Aberdeen Proving Ground, MD													
PD TESS - PM/MS C - Core Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.108	Nov 2017	0.000		0.000		-		0.000	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	0.000		1.286	Jan 2019	1.343	Dec 2019	-		1.343	Continuing	Continuing	0.000
CBMAI - PM/MS C - Core Support	MIPR	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.000		0.046	Dec 2018	0.150	Dec 2019	-		0.150	Continuing	Continuing	0.000
		Subtotal	10.078	1.843		1.332		1.493		-		1.493	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.474	14.532		9.056		7.775		-		7.775	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

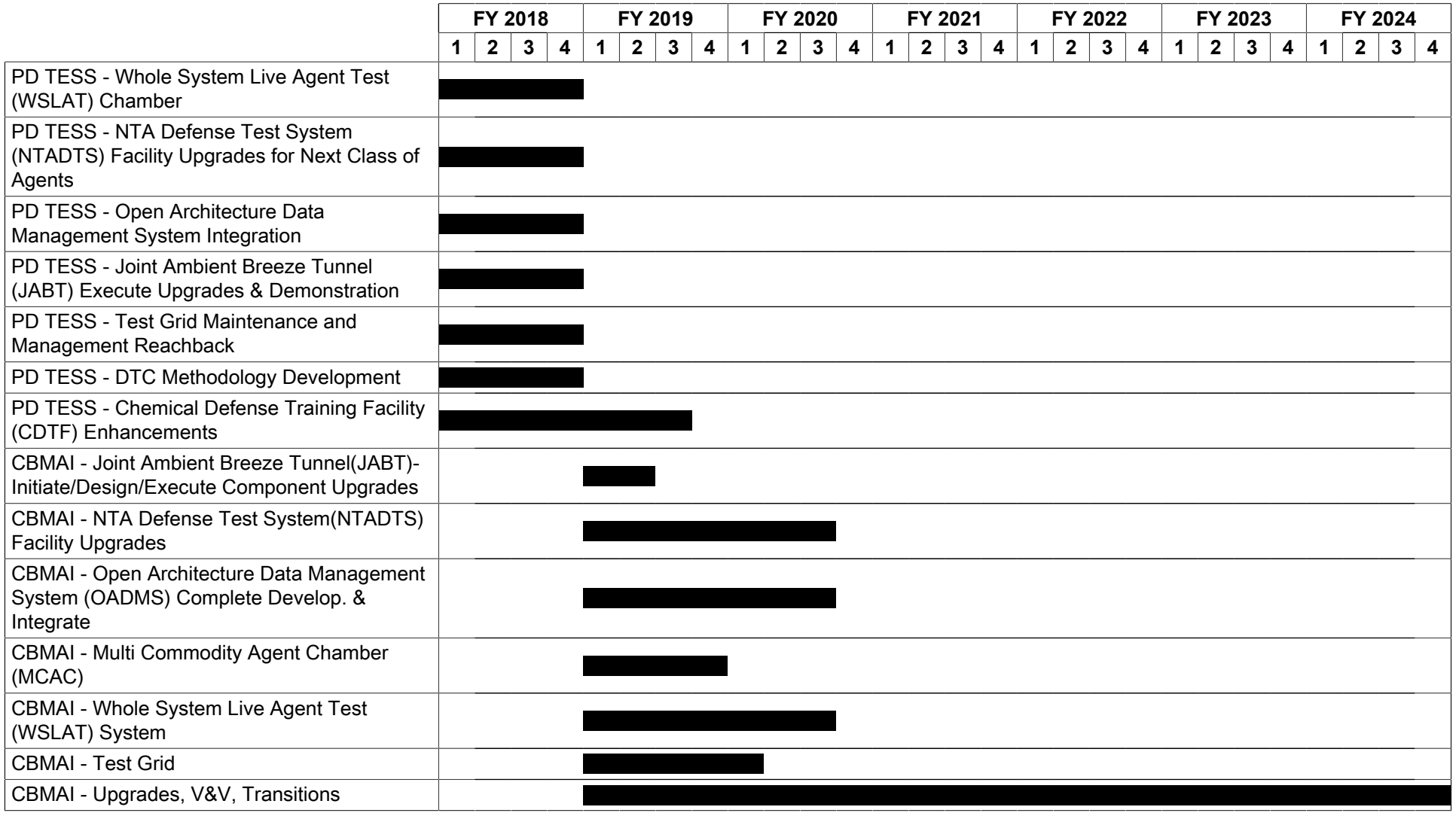

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 5	**R-1 Program Element (Number/Name)** PE 0604384BP / *CHEMICAL/BIOLOGICAL DEFENSE (EMD)*	**Project (Number/Name)** TE5 / *TEST & EVALUATION (EMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PD TESS - Whole System Live Agent Test (WSLAT) Chamber	1	2018	4	2018
PD TESS - NTA Defense Test System (NTADTS) Facility Upgrades for Next Class of Agents	1	2018	4	2018
PD TESS - Open Architecture Data Management System Integration	1	2018	4	2018
PD TESS - Joint Ambient Breeze Tunnel (JABT) Execute Upgrades & Demonstration	1	2018	4	2018
PD TESS - Test Grid Maintenance and Management Reachback	1	2018	4	2018
PD TESS - DTC Methodology Development	1	2018	4	2018
PD TESS - Chemical Defense Training Facility (CDTF) Enhancements	1	2018	3	2019
CBMAI - Joint Ambient Breeze Tunnel(JABT)- Initiate/Design/Execute Component Upgrades	1	2019	2	2019
CBMAI - NTA Defense Test System(NTADTS) Facility Upgrades	1	2019	3	2020
CBMAI - Open Architecture Data Management System (OADMS) Complete Develop. & Integrate	1	2019	3	2020
CBMAI - Multi Commodity Agent Chamber (MCAC)	1	2019	4	2019
CBMAI - Whole System Live Agent Test (WSLAT) System	1	2019	3	2020
CBMAI - Test Grid	1	2019	1	2020
CBMAI - Upgrades, V&V, Transitions	1	2019	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	105.122	102.883	110.363	-	110.363	112.226	111.312	111.921	112.171	Continuing	Continuing
DT6: *JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)*	-	4.185	3.600	3.600	-	3.600	3.600	3.600	3.600	3.600	Continuing	Continuing
DW6: *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*	-	51.759	54.056	55.388	-	55.388	56.463	56.170	56.517	56.507	Continuing	Continuing
LS6: *LABORATORY SUPPORT*	-	14.875	13.537	13.123	-	13.123	13.078	13.078	13.076	13.074	Continuing	Continuing
MS6: *RDT&E MGT SUPPORT*	-	32.803	31.234	37.252	-	37.252	38.085	37.464	37.728	37.990	Continuing	Continuing
O49: *JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)*	-	1.500	0.456	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 PE support Joint Doctrine and Training, sustains the technical test capability at West Desert Test Center (WDTC), sustains the core DoD CB 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 Bio-Test Branch (ECBC) 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.

- RDT&E Management (MS6): management support for the DoD CBDP to allow program overview and integration of overall medical and non-medical programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)), through the Deputy Assistant Secretary of Defense for Chemical Biological Defense (DASD(CBD)).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*

- Joint Concepts, Studies, and Analyses (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. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	104.348	102.883	107.245	-	107.245
Current President's Budget	105.122	102.883	110.363	-	110.363
Total Adjustments	0.774	0.000	3.118	-	3.118
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	2.769	-			
• SBIR/STTR Transfer	-1.995	-			
• Other Adjustments	0.000	-	3.118	-	3.118

Change Summary Explanation

Funding: FY18 (+$2.769M): Reprogrammings to support CBDP Defense Finance and Accounting System transactions and Financial Improvement & Audit Readiness.
FY18 (-$1.995M): Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts.

FY20 (+$3.118M): (+$2.518M) Program adjustments to balance portfolio efforts, and (+$0.600M) Increase for Other Medical Countermeasure Development related laboratory support.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	Project (Number/Name) DT6 / *JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
DT6: *JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)*	-	4.185	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 activities of this project directly support the Joint Service CB defense program; in particular, the development of Joint Chemical, Biological, Radiological, and Nuclear (CBRN) defense capability requirements and the improvement of CBRN defense related doctrine, education, training, and awareness at the Joint and Service levels. The purpose of this requirement is to provide technical and SME support in the areas of: related Chemical, Biological, Radiological, and Nuclear Defense (CBRND)/Countering Weapons of Mass Destruction (CWMD); Joint and Multi-Service doctrine development; Joint and Service training, leadership development, education, and exercises. This effort provides for: (1) Development, coordination, and integration of Joint CBRN defense capability requirements; (2) Development/ revision of medical and non-medical CBRN defense Multi-Service Tactics, Techniques, and Procedures (MTTP) and development/revision of Joint Doctrine and Tactics, Techniques, and Procedures (JTTP); (3) The CBDP Joint Senior Leader Course (JSLC); (4) Assistance in correcting training and doctrine deficiencies covered in the lessons learned process, combat operations, capability development studies and Department of Defense Inspector General (DODIG) and Government Accountability Office (GAO) reports and; (5) Support of current and planned CBRN defense studies, analysis, training, exercises, and war games; determine overlaps, duplication, and shortfalls; and build and execute programs to correct shortfalls in all aspects of CBRN defense across all DoD mission areas.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) JOINT REQUIREMENTS OFFICE (JRO) DT	4.185	3.600	3.600
Description: Support technical reviews of Joint and Multi-service CBRN Defense/CWMD doctrinal materials and develop CBRND/CWMD related MTTP manuals; plan and conduct CBRN defense/CWMD Joint Professional Military Education (JPME); provide CBRN defense/CWMD planning, execution and SME support to Combatant Command (COCOM) and Joint Task Force (JTF) level exercises; and conduct staff and leader CBRN defense/CWMD training for CCMD and JTF level commands. Provides support to the National Defense University (NDU) Center for the Study of Weapons of Mass Destruction (WMD) to support their efforts as the Chairman's focal point for CWMD JPME.			
FY 2019 Plans: 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.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** DT6 / *JOINT DOCTRINE AND TRAINING SUPPORT (RDT&E MGT SUPPORT)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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.			
Accomplishments/Planned Programs Subtotals	4.185	3.600	3.600

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	Project (Number/Name) DW6 / *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
DW6: *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*	-	51.759	54.056	55.388	-	55.388	56.463	56.170	56.517	56.507	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 Biological Test Branch of the Edgewood Chemical and Biological Center (BTB-ECBC), both part of the Major Range and Test Facility Base (MRTFB) located at Dugway Proving Ground (DPG). Project provides overhead (institutional) funding required to operate WDTC and BTB-ECBC in compliance with Section 232 of the National Defense Authorization Act (NDAA) for FY03 (Public Law 107-314 - December 2002).

WDTC and BTB-ECBC are the reliance 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 IAW Program Budget Decision 250 (1996).

WDTC and BTB-ECBC use state-of-the-art chemical and life-sciences test facilities and test chambers to perform CB defense testing of protective gear, decontamination systems, detectors, equipment, and non-materiel CB defense solutions while maintaining safety, security, and surety of chemical agents and biological pathogens. WDTC also provides test ranges, to include fully instrumented outdoor ranges, for TTPD activities and testing with simulants that can be correlated to the laboratory testing with live agents to ensure reliable and repeatable data 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 Bio-Testing Branch (BTB) to ECBC will enable the DoD BSAT Biosafety Program to meet end to end enterprise tracking, reporting, and auditability requirements within an approved Governance, Risks, and Compliance framework. The laboratory commanders and directors are best able to identify potential risk through the use of local risk assessments and are responsible to promote cultures of safety and responsibility. Direct liaison with and oversight by the 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)	FY 2018	FY 2019	FY 2020
Title: 1) BTB TEST - Civilian Labor	3.837	4.133	3.364

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** DW6 / *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Maintain BTB-ECBC, 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. ***FY 2020 Plans:*** Maintain BTB-ECBC, 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.			
Title: 2) BTB TEST - LSTF 24-Hour Support ***FY 2019 Plans:*** 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 Lother Solomon Test Facility (LSTF) Complex and the Baker Lab. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.700	0.900	0.598
Title: 3) BTB TEST - Sustainment ***FY 2019 Plans:*** Provides for ongoing sustainment of existing test instrumentation and equipment at BTB-ECBC, in support of their operations. Support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-related replacement of existing field, administrative, and analytical instrumentation components and systems. Also provides for additional office and laboratory equipment required for the inspection and certification for Building 2029 LSTF Annex. ***FY 2020 Plans:*** Provides for ongoing sustainment of existing test instrumentation and equipment at BTB-ECBC, in support of their operations. Support annual service contracts for equipment operation, diagnostics, and calibration, as well as routine life-cycle and use-	0.800	1.412	2.842

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** DW6 / *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.			
Title: 4) BTB TEST - Support ***FY 2019 Plans:*** Support the BTB-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. ***FY 2020 Plans:*** Support the BTB-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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.600	0.600	0.758
Title: 5) WDTC, MRTFB - Civilian Labor ***Description:*** Represents the civilian labor and MRTFB operating costs required to support operations, which cannot be directly tied to a single test customer. Civilian personnel 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. ***FY 2019 Plans:*** Maintain WDTC technical test capability and operations to include institutional civilian labor costs. Develop the workforce to include getting acquisition, Information Technology (IT), Financial Management (FM) and technical certifications, execute funding in accordance with regulations and obligation and expenditure goals, and manage range movement for the safety of personnel. ***FY 2020 Plans:***	23.937	25.306	25.736

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** DW6 / *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Maintain WDTC technical test capability and operations to include institutional civilian labor costs. Develop the workforce to include getting acquisition, IT, FM and technical certifications, execute funding in accordance with regulations and obligation and expenditure goals, and manage range movement for the safety of personnel. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 6) WDTC, MRTFB - Sustainment ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	5.705	5.200	5.615
Title: 7) WDTC, MRTFB - Support ***FY 2019 Plans:*** Provide WDTC with a specially trained support staff to operate and maintain all critical control systems such as test specific HVAC systems and decontamination systems within WDTC's Material Test Facility (MTF) and Combined Chemical Test Facility (CCTF). ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	1.982	1.946	1.872
Title: 8) WDTC, MRTFB - Contractor Labor, Overhead ***Description:*** The institutional cost of providing contractual effort to the MRTFB including chemical and biological analysis, field support, planning, and report documentation. Contractual efforts support variable workload rates and address capacity shortfalls created by civilian authorization limits.	13.202	13.540	13.570

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** DW6 / *MAJOR RANGE AND TEST FACILITY BASE (MRTFB)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Support the WDTC defense mission by funding contractor labor overhead costs. ***FY 2020 Plans:*** Support the WDTC defense mission by funding contractor labor overhead costs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 9) NON-TRADITIONAL AGENT (NTA) TEST ***FY 2019 Plans:*** 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 uniform materials and protective masks. Continue to develop chemical dissemination and challenge monitoring methods for other NTA classes. ***FY 2020 Plans:*** 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 uniform materials and protective masks. Continue to develop chemical dissemination and challenge monitoring methods for other NTA classes. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.996	1.019	1.033
Accomplishments/Planned Programs Subtotals	51.759	54.056	55.388

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	Project (Number/Name) LS6 / *LABORATORY SUPPORT*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
LS6: *LABORATORY SUPPORT*	-	14.875	13.537	13.123	-	13.123	13.078	13.078	13.076	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 DoD laboratory infrastructure capabilities to counter an expanding threat space, exploit advances in technology, and develop and transition CB defense equipment and countermeasures to the Warfighter. This laboratory infrastructure project upgrades key systems to the current state-of-the-art capabilities. Key systems include: gas filters, mechanical/electrical, fume hoods, duct work and structural systems. Provides for the initial equipment outfitting of new facilities. Ensures that the necessary surety operations can be conducted effectively and safely in support of Chemical and Biological Defense Program (CBDP) RDT&E programs. As a force multiplier, this project will provide more robust capabilities to the CBDP and ensure continuity of operations and environmental compliance.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) LABINF - Edgewood Chemical Biological Center Surety Facility Sustainment	11.183	11.927	11.140
FY 2019 Plans: Modernization efforts continue to be directed at 25 year or older surety laboratory infrastructure. FY19 planned efforts include site preparation and design for Data Reduction building, upgrade up to 3 specific labs to correct deficiencies in prior year design build contracts to complete this phase of the projects, and phase II upgrade Toxic Exhaust from simplex fans system to fully redundant duplex fan systems (i.e. Variable Frequency drives, new exhaust stacks lightning protection, transfer switched and control building). 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.			
FY 2020 Plans: Modernization efforts continue to be directed at 25 year or older surety laboratory infrastructure. FY20 planned efforts include: Phase III 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 CBDP core capabilities. Sustainment efforts provide for gas filter maintenance and change out, and sustainment of critical laboratory systems.			
FY 2019 to FY 2020 Increase/Decrease Statement: Minor change due to routine program adjustments.			
Title: 2) LABINF - USAMRIID/USAMRICD Infrastructure Support	3.692	1.610	1.983
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** LS6 / *LABORATORY SUPPORT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continues support to laboratory infrastructure for laboratory operations, facilities sustainment, and regulatory compliance for critical chemical biological defense activities at the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) and the U.S. Army Medical Research Institute for Chemical Defense (USAMRICD). Activities supported include laboratory support operations, maintenance and repair of existing capabilities (including information management and information technology (IM/IT) systems maintenance, and preventive and corrective maintenance on scientific and laboratory support systems), chemical agent security, quality systems compliance, chemical and biological safety, and research protections. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** 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.			
Accomplishments/Planned Programs Subtotals	14.875	13.537	13.123

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*				Project (Number/Name) MS6 / *RDT&E MGT SUPPORT*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
MS6: *RDT&E MGT SUPPORT*	-	32.803	31.234	37.252	-	37.252	38.085	37.464	37.728	37.990	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides management support for the DoD Chemical and Biological Defense Program (CBDP). It includes program oversight and integration of overall non-CBRN Defense Equipment (non-CDE) and CBRN Defense Equipment (CDE) programs by the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ASD(NCB)) and defense programs through the Deputy Assistant Secretary of Defense for Chemical and Biological Defense (DASD(CBD)). Funds execution management is provided by 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 3170.01I dated 23 January 2015; Joint CBRN Defense Research, Development, and Acquisition (RDA) planning; input to the CBD Annual Report to Congress; and program guidance development by the Program Analysis and Integration Office (PAIO).

The Biological Select Agent and Toxin (BSAT) Biosafety Program Office (BBPO) will advise the Executive Agent Responsible Official (EA RO) for the DoD BSAT Biosafety Program on biosafety and all matters that pertain to risk associated with BSAT operations, provide oversight of DoD BSAT laboratory biosafety operations, serve as a unified DoD interface with external regulatory agencies, ensure safety and standardization of procedures used in DoD BSAT laboratories, and identify industry-wide best practices to enhance biosafety across the full spectrum of DoD BSAT operations. As the EA RO for BSAT the program is tasked with technical review, inspection, and harmonization of biosafety protocols and procedures across DoD laboratories that handle BSAT. As such, the program manages the Biosafety and Scientific Review Panel, inspection of DoD laboratories, harmonization of DoD BSAT-related regulations and procedures, coordinating interaction and information with the CDC, establishing a Defense Business System to track and manage BSAT across DoD, providing laboratory biosafety oversight, and advancing BSAT-related scientific research to address knowledge gaps. 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 biological select agents and toxins (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 project includes programming support for the Joint Service CB Information System (JSCBIS) which serves as a budgetary and informational database for the DoD CBDP. Also included within the project is financial management services to include fund distribution, execution reporting, and fiscal financial statements.

This project also supports the Chemical, Biological, Radiological and Nuclear Defense (CBRND) Test and Evaluation (T&E) Executive, who is responsible for the planning, balancing, and oversight of test infrastructure and test technology requirements to support Developmental Testing (DT) and Operational Testing (OT) of DoD CBRND systems, as outlined in the RDA Plan. The CBRND T&E Executive oversees the Enterprise processes to develop and sustain standardized T&E methodologies and validated instrumentation and infrastructure to ensure the adequacy of test for CBRND systems in alignment with acquisition milestones and associated decision

points. The Joint Test Infrastructure Working Group (JTIWG) program supports T&E Early Involvement; test threat planning; T&E studies; and T&E standards planning and development to support CBRND testing for all Services to include medical T&E efforts.

The CBRND T&E Executive directly supports OSD T&E oversight of acquisition programs and provides the mechanism for early T&E involvement in the acquisition process. The CBRND T&E Executive provides the T&E infrastructure investment strategy and coordinates investment planning and T&E capabilities validation among the Joint Service Community to ensure that program needs are met. The CBRND T&E Executive oversees the T&E processes to ensure end to end feedback loops to support to the Warfighter.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) BSAT RSRCH SPT	-	-	1.051
FY 2020 Plans: The Scientific Gaps in Biorisk Research Program (SGBRP) supports research that addresses biological select agents 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 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).			
FY 2019 to FY 2020 Increase/Decrease Statement: Program/project funding transferred from another funding line.			
Title: 2) OSD BIOSAFETY	1.542	2.138	2.233
FY 2019 Plans: Maintain program staffing. Develop and maintain BSAT training products. Maintain Quality Management System, and Defense BSAT Business System. Conduct life cycle management. Continue to perform laboratory site visits. Execute regular stakeholders meetings. Conduct observation of laboratory inspection and maintain oversight of DoD BSAT inspection program. Conduct protocol reviews, publish guidance and procedures from quarterly BSRP meetings. Maintain interagency engagement. Fund research to address safety-related scientific knowledge gaps.			
FY 2020 Plans: 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. 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,			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** MS6 / *RDT&E MGT SUPPORT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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 though the Scientific Gaps in Biorisk Research Program (SGBRP) to address safety-related scientific knowledge gaps. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) JRO MGT ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	6.254	5.700	8.607
Title: 4) JTIWG ***FY 2019 Plans:*** Continue T&E Executive mission support to ensure credible testing; T&E Early Involvement; T&E Studies; evaluation and decision support for CBDP systems; support the DOT&E for OSD T&E Oversight; and support the NCB in infrastructure planning; input to the future year budgeting process; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in test infrastructure. Continue efforts to identify and mitigate critical Test and Evaluation Gaps in order to reduce cost/test schedule impacts to near-term Programs of	7.229	6.989	6.402

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** MS6 / *RDT&E MGT SUPPORT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Record (PORs). Continue to align and streamline policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies. ***FY 2020 Plans:*** Continue T&E Executive mission support to ensure credible testing; T&E Early Involvement; T&E Studies; evaluation and decision support for CBDP systems; support the DOT&E for OSD T&E Oversight; and support the NCB in infrastructure planning; input to the POM process; continue efforts to develop, refine, and/or streamline processes for identifying, assessing, and addressing gaps in T&E capabilities to ensure timely support to acquisition programs. Continue mission to improve the quality and reduce the costs of test planning and execution; eliminate unnecessary redundancies in test infrastructure. Continue efforts to identify and mitigate critical Test and Evaluation Gaps in order to reduce cost/test schedule impacts to near-term PORs. Continue to align and streamline policies and processes to support more efficient and effective management and sustainment of test infrastructure and methodologies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project schedule.			
Title: 5) OSD MGT ***FY 2019 Plans:*** Perform program reviews/assessments, provide programmatic Planning, Programming, Budgeting and Execution (PPBE) oversight/analysis, and provide congressional issue analysis and support. Support financial management services provided by DTRA, such as funding distribution and execution reporting. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project funding transferred from another funding line.	11.053	7.777	11.667
Title: 6) PAIO MGT ***FY 2019 Plans:*** 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 Joint Service Chemical Biological Information System (JSCBIS) database management and complete the JSCBIS modernization effort. ***FY 2020 Plans:***	6.725	8.630	7.292

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** MS6 / *RDT&E MGT SUPPORT*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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 Joint Service Chemical Biological Information System database management in the modernized system. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	32.803	31.234	37.252

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 6	R-1 Program Element (Number/Name) PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	Project (Number/Name) O49 / *JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
O49: *JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)*	-	1.500	0.456	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 2018	FY 2019	FY 2020
Title: 1) JCSA	1.500	0.456	1.000
Description: This program was formerly called Joint Combat Development and Experimentation (JCDE) and will continue the analysis performed under that program. In addition, JCSA will perform Advanced Threat Analysis with several more categories of threat than JCDE. JCSA updates the best representative agents for consideration in requirements and testing. JCSA also conducts detailed quantitative analyses to determine detection and challenge levels from key representative threats determined in the Advanced Threat Studies. JCSA also updates detailed operational risk analyses to support Chemical and Biological Defense Program (CBDP) leadership decisions.			
FY 2019 Plans: 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.			
FY 2020 Plans: 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			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605384BP / *CHEMICAL/BIOLOGICAL DEFENSE (RDT&E MGT SUPPORT)*	**Project (Number/Name)** O49 / *JOINT CONCEPTS, STUDIES, AND ANALYSES (JCSA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	1.500	0.456	1.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605502BP / *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	20.057	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.057
SB6: *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*	-	20.057	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.057

A. Mission Description and Budget Item Justification

The overall objective of the CBD SBIR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	20.057	0.000	0.000	-	0.000
Total Adjustments	20.057	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-0.001	-			
• SBIR/STTR Transfer	20.058	-			
• Other Adjustments	0.000	-	-	-	-

Change Summary Explanation

Funding: FY18 (+$20.058M): Funding transferred and applied to SBIR program.

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 6					R-1 Program Element (Number/Name) PE 0605502BP / *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*				Project (Number/Name) SB6 / *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
SB6: *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*	-	20.057	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.057
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The SBIR Program is a Congressionally mandated program established to increase the participation of small business in federal research and development (R&D). Currently, each participating Government agency must reserve 2.5% of its extramural R&D for SBIR awards to competing small businesses. The goal of the SBIR Program is to invest in the innovative capabilities of the small business community to help meet Government R&D objectives while allowing small companies to develop technologies and products which they can then commercialize through sales back to the Government or in the private sector.

The Small Business Technology Transfer (STTR) Program like SBIR, is a Government-wide program, mandated by the Small Business Research and Development Enhancement Act of 1992, PL 102-564. STTR was established in FY94 as a three-year pilot program. In early 1996, the General Accounting Office (GAO) conducted a comprehensive review of the Government-wide STTR Program to determine the effectiveness of the pilot program. Upon review of the GAO report, Congress voted to reauthorize the STTR Program to the year 2000, consistent with the authorization period for the SBIR Program.

STTR was established as a companion program to the SBIR Program and is executed in essentially the same manner; however, there are several distinct differences. The STTR Program provides a mechanism for participation by university, Federally-Funded Research and Development Centers (FFRDCs), and other non-profit research institutions. Specifically, the STTR Program is designed to provide an incentive for small companies and research at academic institutions and non-profit research and development institutions to work together to move emerging technical ideas from the laboratory to the marketplace to foster high-tech economic development and to advance U.S. economic competitiveness. Each STTR proposal must be submitted by a team which includes a small business (as the prime contractor for contracting purposes) and at least one research institution, which have entered into a Cooperative Research and Development Agreement for the purposes of the STTR effort. Furthermore, the project must be divided up such that the small business performs at least 40% of the work and the research institution(s) performs at least 30% of the work. The remainder of the work may be performed by either party or a third party. The budget is separate from the SBIR budget and is significantly smaller (0.15% of the extramural R&D budget vs. 2.5% for the SBIR Program).

The DoD has consolidated management and oversight of the CBDP into a single office within the OSD. The Army was designated as the Executive Agent for coordination and integration of the Chemical and Biological Defense (CBD) program. The executive agent for the SBIR/STTR portion of the program is the Army Research Office-Washington.

The overall objective of the CBD SBIR/STTR program is to improve the transition or transfer of innovative CBD technologies between DoD components and the private sector for mutual benefit. The CBD program includes those technology efforts that maximize a strong defensive posture in a biological or chemical environment using

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 6	**R-1 Program Element (Number/Name)** PE 0605502BP / *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*	**Project (Number/Name)** SB6 / *SMALL BUSINESS INNOVATIVE RESEARCH (SBIR)*

passive and active means as deterrents. These technologies include chemical and biological detection; information assessment, which includes identification, modeling, and intelligence; contamination avoidance; and protection of both individual soldiers and equipment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) SBIR/STTR ***Description:*** Small Business Innovative Research.	20.057	-	-
Accomplishments/Planned Programs Subtotals	20.057	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	43.632	43.741	54.023	-	54.023	45.999	44.735	46.063	51.036	Continuing	Continuing
CA7: *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*	-	5.690	6.299	10.278	-	10.278	6.473	6.870	8.366	7.867	Continuing	Continuing
CM7: *HOMELAND DEFENSE (OP SYS DEV)*	-	1.623	1.455	2.786	-	2.786	4.280	4.277	6.113	6.113	Continuing	Continuing
C07: *COLLECTIVE PROTECTION (OP SYS DEV)*	-	4.592	3.456	5.755	-	5.755	2.900	0.951	1.599	1.699	Continuing	Continuing
DE7: *DECONTAMINATION SYSTEMS (OSD)*	-	0.000	0.085	1.942	-	1.942	0.636	0.636	0.636	0.636	Continuing	Continuing
IP7: *INDIVIDUAL PROTECTION (OP SYS DEV)*	-	2.134	2.056	6.080	-	6.080	6.492	8.482	8.461	8.460	Continuing	Continuing
IS7: *INFORMATION SYSTEMS (OP SYS DEV)*	-	11.923	15.051	16.811	-	16.811	16.133	14.916	12.993	12.993	Continuing	Continuing
MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	-	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	Continuing	Continuing
MC7: *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*	-	0.000	0.000	1.248	-	1.248	0.000	0.000	0.000	0.000	0.000	1.248
TE7: *TEST & EVALUATION (OP SYS DEV)*	-	6.475	6.318	5.403	-	5.403	5.720	5.716	5.716	5.716	Continuing	Continuing

A. Mission Description and Budget Item Justification

The projects in this 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 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*

- 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.

- 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 CBR contamination.

- Decontamination Systems (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.

- 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 his/her performance.

- Information Systems (IS7): technology refresh of fielded information systems that shape the battlespace against CBR threats.

- 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.

- 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.

- 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.

The projects in this PE support operational systems development necessary to maintain operational effectiveness and are therefore correctly placed in Budget Activity 7.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Chemical and Biological Defense Program	Date: March 2019
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	45.677	48.741	43.159	-	43.159
Current President's Budget	43.632	43.741	54.023	-	54.023
Total Adjustments	-2.045	-5.000	10.864	-	10.864
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	0.000	-5.000			
• Congressional Rescissions	-	-			
• Congressional Adds	0.000	-			
• Congressional Directed Transfers	0.000	-			
• Reprogrammings	-1.192	-			
• SBIR/STTR Transfer	-0.853	-			
• Other Adjustments	0.000	-	10.864	-	10.864

Change Summary Explanation

Funding: FY18: (-$.853M) Transfer of funding to support Small Business Innovative Research/Small Business Technology Transfer efforts and (-$1.192M) Program Reprogrammings.

FY19 (-$5.000M): Congressional Directed Reductions.

FY20 - Provides for critical new starts JCAD SLA (+$3.892M); ALS MOD (+$1.347M); SPU RCDD IFS (+$2.994M); INATS SNAPP (+$1.248M); completion of JECP FLTC (+$1.997M); and other adjustments (-$.609M).

Schedule: N/A

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*				Project (Number/Name) CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
CA7: *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*	-	5.690	6.299	10.278	-	10.278	6.473	6.870	8.366	7.867	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) Joint Chemical Agent Detector (JCAD) Solid Liquid Adapter (SLA)
(2) CBRN Dismounted Reconnaissance Systems (CBRN DRS)

The JCAD SLA kit effort continues the development of the JCAD Chemical Explosive Detector (CED), which was an NGCD acceleration effort for USSOCOM. The SLA interfaces with the fielded M4A1 JCAD to allow for solid liquid sampling of surfaces. The SLA kit provides an interim point solution to detect Non-Traditional Agents (NTAs) and Pharmaceutical Based Agents (PBAs) off surfaces as the since the Proximate Chemical Agent Detector (PCAD) program is delayed due to immature non-contact technology. In FY20, JCAD will continue the JCAD SLA Contract to verify production readiness for testing.

The CBRN DRS consists of portable, commercial and Government off-the-shelf equipment which provides personnel protection from current and emerging CBRN hazards through detection, identification, sample collection, decontamination, marking, and hazard reporting for CBRN and emerging threats. This project provides the technology upgrade and refresh effort for the Chemical Biological Radiological Nuclear Dismounted Reconnaissance Systems (CBRN DRS) to address and mitigate technology/equipment obsolescence. Experimentation and demonstration will be used in this phase to reduce risk and inform supporting materiel solutions, CONOPS and TTPs. This project provides the technology upgrade and refresh effort for 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. In FY20 funding will be used to assess, test, and integrate updated capabilities identified in prior efforts focusing on protective ensembles.

B. Accomplishments/Planned Programs ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020**
Title: 1) CBRN DRS	5.690	6.299	6.386
Description: Provide analysis of the existing components of CBRN Dismounted Reconnaissance Sets, Kits, and Outfits Increment 1 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			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
candidates that could correct concerns, and integrate the new items into the product baseline. Identifies and tests technology that can meet emerging requirements. ***FY 2019 Plans:*** Continue 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 changes to product baseline. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) JCAD ***Description:*** Product Development, Testing and Program Management ***FY 2020 Plans:*** Initiate JCAD SLA Contract to verify production readiness with First Article Testing, complete production verification testing and program management support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase. Engineering Change Proposal transitioning to JCAD procurement line	-	-	3.892
Accomplishments/Planned Programs Subtotals	5.690	6.299	10.278

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

CBRN DISMOUNTED RECONNAISSANCE SYSTEMS

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*

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. Capability sets will be identified as engineering change proposals to the base kit, produced and fielded in accordance with priorities and needs of the Services. Multiple kits will be identified based on readiness for integration throughout the life of the program. CBRN DRS systems will be produced using a workshare approach between Organic assets and Contractor production facilities.

JOINT CHEMICAL AGENT DETECTOR (JCAD)

The JCAD SLA is a developmental effort to expand existing JCAD capabilities to include NTA, explosive and opioid capability. Upon successful evaluation and product integration efforts, the JCAD SLA will be integrated with one of the planned CBRN DRS Advanced Capabilities Sets via engineering change proposal. The JCAD SLA kit will be an Additional Authorized List (AAL) item to the M4A1 JCAD.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN DRS - HW C - HW - Product Development	MIPR	Defense Logistics Agency : Philadelphia, PA	0.925	1.352	Mar 2018	0.608	Jan 2019	0.974	Nov 2019	-		0.974	Continuing	Continuing	0.000
CBRN DRS - HW C - ECBC - Matrix	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.475	Nov 2017	0.393	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
CBRN DRS - HW - Product Development	MIPR	Various : Various	1.146	0.320	Nov 2017	1.000	Nov 2018	0.750	Nov 2019	-		0.750	Continuing	Continuing	0.000
JCAD - HW C - Contract	SS/FFP	Smiths Detection : Edgewood, MD	0.000	0.000		0.000		1.350	Nov 2019	-		1.350	Continuing	Continuing	0.000
		Subtotal	2.071	2.147		2.001		3.074		-		3.074	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN DRS - ES - Market Analysis	MIPR	Various : Various	1.561	0.317	Dec 2017	0.510	Jan 2019	0.500	Nov 2019	-		0.500	Continuing	Continuing	0.000
CBRN DRS - ES - Obsolescence Management	MIPR	Various : Various	1.040	1.036	Dec 2017	1.000	Dec 2018	1.000	Nov 2019	-		1.000	Continuing	Continuing	0.000
		Subtotal	2.601	1.353		1.510		1.500		-		1.500	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN DRS - OTE - Candidate Testing	Various	Various : Various	3.026	1.780	Nov 2017	1.765	Jan 2019	1.780	Mar 2020	-		1.780	Continuing	Continuing	0.000
JCAD - DTE C - Test and Evaluation	MIPR	Various : Various	0.000	0.000		0.000		2.100	Mar 2020	-		2.100	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	3.026	1.780		1.765		3.880		-		3.880	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CBRN DRS - PM - Program Management and Systems Engineering Support	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	1.482	0.410	Nov 2017	1.023	Dec 2018	1.382	Nov 2019	-		1.382	Continuing	Continuing	0.000
JCAD - PM/MS C - Management Services	MIPR	JPM NBC Contamination Avoidance (JPM NBC CA) : JPEO, Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.442	Oct 2019	-		0.442	Continuing	Continuing	0.000
		Subtotal	1.482	0.410		1.023		1.824		-		1.824	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.180	5.690		6.299		10.278		-		10.278	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*

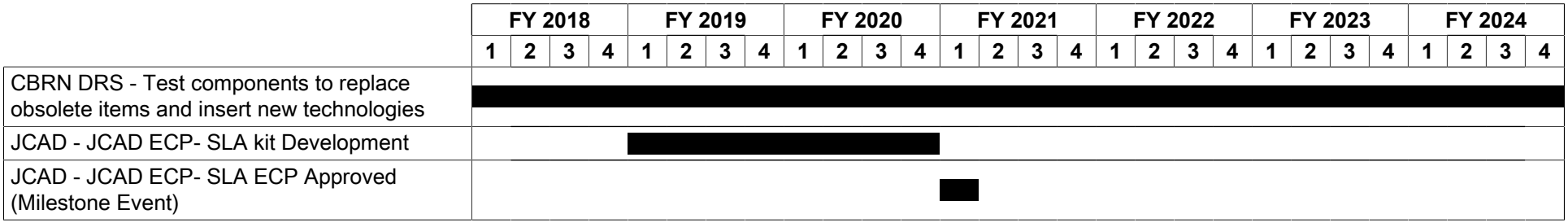

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CA7 / *CONTAMINATION AVOIDANCE OPERATIONAL SYS DEV (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CBRN DRS - Test components to replace obsolete items and insert new technologies	1	2018	4	2024
JCAD - JCAD ECP- SLA kit Development	1	2019	4	2020
JCAD - JCAD ECP- SLA ECP Approved (Milestone Event)	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) CM7 / *HOMELAND DEFENSE (OP SYS DEV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CM7: *HOMELAND DEFENSE (OP SYS DEV)*	-	1.623	1.455	2.786	-	2.786	4.280	4.277	6.113	6.113	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 effort 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.

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)	FY 2018	FY 2019	FY 2020
Title: 1) ALS MOD	-	-	1.347
Description: This program element supports the evaluation of analytical components for technical refreshment of the CALS and ALS MOD. Efforts in the program element support 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.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CM7 / *HOMELAND DEFENSE (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) WMD CST ***Description:*** 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. ***FY 2019 Plans:*** 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 integrated logistics support (ILS) management (e.g., maintenance support, facilities, personnel, training, testing, and activation of the system). ***FY 2020 Plans:*** 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). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	1.623	1.455	1.439
Accomplishments/Planned Programs Subtotals	1.623	1.455	2.786

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** 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. As such, this program will follow the requirements defined by the CALS and ALS Capability Production Document. The CALS and ALS MOD capability will be modular, scalable and adaptable to various environmental conditions. Additionally, the CALS and ALS MOD will support the specific mission and CONOPS of the gaining unit and will be able to detect and/or identify Chemical Warfare Agents (CWAs), Toxic Industrial Chemicals (TICs), Toxic Industrial Materials (TIMs), Biological Warfare Agents (BWAs), and radiological material in environmental samples.

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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) CM7 / *HOMELAND DEFENSE (OP SYS DEV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALS MOD - ILS S - ALS MOD	Various	TBD : TBD	0.000	0.000		0.000		0.500	Dec 2019	-		0.500	Continuing	Continuing	0.000
WMD CST - ES C - Science & Engineering Program Management Support	Various	Battelle Memorial Institute : Aberdeen, MD	1.077	0.481	Jan 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	1.077	0.481		0.000		0.500		-		0.500	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALS MOD - OTE C	Various	TBD : TBD	0.000	0.000		0.000		0.325	Mar 2020	-		0.325	Continuing	Continuing	0.000
WMD CST - OTHT C - CBRN COTS Component	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	3.967	0.937	Mar 2018	0.940	Mar 2019	0.889	Feb 2020	-		0.889	Continuing	Continuing	0.000
		Subtotal	3.967	0.937		0.940		1.214		-		1.214	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ALS MOD - PM/MS SB - ALS MOD	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.522	Nov 2019	-		0.522	Continuing	Continuing	0.000
WMD CST - PM/MS SB - CBRN COTS	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.556	0.205	Jan 2018	0.515	Jan 2019	0.550	Jan 2020	-		0.550	Continuing	Continuing	0.000
		Subtotal	1.556	0.205		0.515		1.072		-		1.072	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) CM7 / *HOMELAND DEFENSE (OP SYS DEV)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.600	1.623		1.455		2.786		-		2.786	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CM7 / *HOMELAND DEFENSE (OP SYS DEV)*

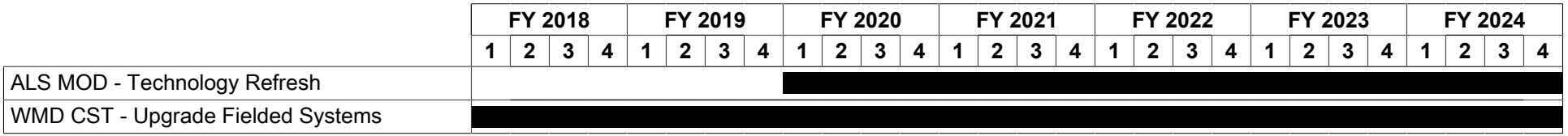

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** CM7 / *HOMELAND DEFENSE (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALS MOD - Technology Refresh	1	2020	4	2024
WMD CST - Upgrade Fielded Systems	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
C07: *COLLECTIVE PROTECTION (OP SYS DEV)*	-	4.592	3.456	5.755	-	5.755	2.900	0.951	1.599	1.699	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) Modernization Protection (MODPROT)
(2) Joint Expeditionary Collective Protection (JECP)

MODPROT CP provides upgrades, improvements and modernizations to fielded Collective Protection Systems such as the Chemical and Biological Protective Shelter, Shipboard Collective Protection Systems, Fixed Site Collective Protection Systems, M20A1 Simplified Collective Protection Equipment, Modular Collective Protection Equipment systems, and Collectively Protected Field Hospitals. Funding increases the Collective Protection System Backfit program M98 filter set life extension, and identifies and tests replacements for obsolete M93 Gas Particulate Filter Unit (GPFU) components used in numerous hard shelter systems. The M93 GPFU improvements also address current electromagnetic interference requirements. MODPROT CP also addresses obsolescence issues in test quality standards for gas filters and tests sealants and coatings to mitigate corrosion on filter systems to extend service life of these systems.

JECP provides the Joint Expeditionary Forces a CP capability which is lightweight, compact, modular, and affordable. A family of systems, developed in two phases, that will allow the application of CP to transportable soft-side shelters, enclosed spaces of opportunity, and in remote austere locations as a standalone resource. Phase 1 includes standalone CP systems and kits to provide existing host platforms and structures with CBRN protection. Phase 2 includes kits to provide other host platforms and structures that were not explicitly designed in Phase 1. JECP will be capable of protecting personnel groups of varying size, unencumbered by Individual Protective Equipment (IPE), from the effects of CB agents, Toxic Industrial Materials (TIMs), radiological particles, heat, dust, and sand. The employment of JECP is a strategic deterrence against enemy use of CBR agents or TIMs, and will reduce the need for personnel and equipment decontamination. Funding will develop a field leakage test capability that allows Warfighters to validate the integrity of JECP and other fielded collective protection systems, integrate newly developed filtration material into existing M98 Gas Particulate Filter Sets to provide the Warfighter with improved protection against toxic industrial chemicals and toxic industrial materials while maintaining current performance characteristics against Chemical Warfare Agents and meeting military standards, develop a CP kit for non-CP environmental control units and improve on the current tent liner restraint systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Modernization of Collective Protection (MODPROT CP) Equipment	0.964	0.632	3.758

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Modernization Collective Protection provides upgrades, improvements, and modernizations to fielded collective protection systems. ***FY 2019 Plans:*** Continue EMI testing M93 GPFU, continue evaluating CPDEPMEDS ColPro equipment and complete environmental guard bed testing. Begin market survey for M18A1 gas filter leak test detectors and tracer gas replacement and also for sealants, coatings, and materials to mitigate M98 filter housing corrosion. ***FY 2020 Plans:*** Continue Electromagnetic Interference (EMI) testing M93 GPFU, continue evaluating CPDEPMEDS ColPro equipment, and complete environmental M98 guard bed testing. Conduct Non-Destructive Production Acceptance Leak Test with candidate tracer gases on Collective Protection Gas Filters. Conduct market research/material replacement for Ventilated Face Piece Hose refresh and market research of coatings and sealants for corrosion mitigation for CP components. Conduct characterization on the raw material substrates of ASZM-TEDA (Copper-Silver-Zinc-Molybdenum-Triethylenediamine) carbon detail specification First Article Test (FAT) requirement. Conduct design analysis for the seals of the M48A1 Filter Redesign. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Title: 2) Joint Expeditionary Collective Protection (JECP)	3.628	2.824	1.997
Description: JECP will develop a field leakage test capability (FLTC), integrate newly developed filtration material into existing M98 gas particulate filter sets, develop a CP kit for non-CP environmental control units, and improve on the current tent liner restraint systems. ***FY 2019 Plans:*** - FLTC: Award Countering Weapons of Mass Destruction (CWMD) Other Transaction Authority (OTA) contract for the development of prototypes kits (2 prototypes at $36,345 each). Test and evaluate prototypes, develop technical data package, and logistics products including training materials and technical manual updates for incorporation into JECP systems. - M98: Finalize prototype design and development. Award two contracts to develop prototypes under CWMD OTA (15 prototypes of 1 configuration at $1,000 each and 3 prototypes at $18,948 each). Perform developmental testing of prototypes. Begin development of drawing packages and logistics products. Down-select to one material solution. - Non-CP ECU: Finalize logistic products and tech data package in preparation for production decision. ***FY 2020 Plans:*** - FLTC: Finalize logistic products and tech data package in preparation for production decision and fielding.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- M98: Optimize selected solution and conduct final developmental and operational testing and finalize logistic products and tech data package in preparation for production decision and fielding. - TENT LINER: Design and develop improvements to the JECP liner to address the restraint system, hanging mechanisms and floor saver. Identify impacts to tech data and logistics products. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	4.592	3.456	5.755

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MODERNIZATION PROTECTION (MODPROT)

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.

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 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 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 under the Joint Enterprise Research, Development, Acquisition, and Production (JE-RDAP) Contract will be awarded to 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 JE-RDAP competitive delivery order 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

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 interface types for use with collective protection. These efforts involve a simplified acquisition procurement contract and exploitation of commercial off-the-shelf items.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - HW C - Compatibility Engineering M93 GPFU	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.378	Jul 2018	0.125	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - HW C - Compatibility Engineering Non Destructive Test	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000	Dec 2018	0.199	Nov 2019	-		0.199	Continuing	Continuing	0.000
MODPROT - HW C - ASZM-TEDA Carbon Dtl Spec FAT Reqmt	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.717	Nov 2019	-		0.717	Continuing	Continuing	0.000
MODPROT - HW C - Corrosion Mitigation for CP Components	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.000		0.000		0.255	Nov 2019	-		0.255	Continuing	Continuing	0.000
MODPROT - HW C - M48A1 Filter Redesign	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.000		0.000		0.338	Nov 2019	-		0.338	Continuing	Continuing	0.000
MODPROT - HW C - M98 CBR Filters	MIPR	TACOM : Warren, MI	0.000	0.234	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - HW C - Guard bed blank filters	C/FFP	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.027	May 2018	0.020	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
JECP - HW C - Liner Restrain System Improvements	MIPR	US Army Natick Soldier RD&E Center : Natick, MA	0.000	0.000		0.000		0.310	Nov 2019	-		0.310	Continuing	Continuing	0.000
JECP - HW C - Environmental Control Unit Improvements	MIPR	28th Test and Evaluation	0.090	0.361	Feb 2018	0.203	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Squadron : Eglin AFB, FL													
JECP - HW C - Improved M98 Filter Set Design Improvements	SS/CPFF	Army Contracting Command : Picatinny, NJ	0.000	0.746	Nov 2018	0.746	Dec 2018	0.513	Nov 2019	-		0.513	Continuing	Continuing	0.000
JECP - HW S - Field Leakage Test Capability Development	MIPR	US Army Natick Soldier RD&E Center : Natick, MA	0.070	0.258	Feb 2018	0.441	Dec 2018	0.225	Nov 2019	-		0.225	Continuing	Continuing	0.000
JECP - HW S - Field Leakage Test Capability Development #2	SS/CPFF	Army Contracting Command : Picatinny, NJ	0.270	0.206	Nov 2018	0.398	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
JECP - HW C - Improved M98 Filter Set Development	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.596	0.142	Feb 2018	0.202	Dec 2018	0.122	Nov 2019	-		0.122	Continuing	Continuing	0.000
JECP - HW C - Improved M98 Filter Set Design Improvements #2	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	1.192	0.535	Feb 2018	0.120	Dec 2018	0.146	Nov 2019	-		0.146	Continuing	Continuing	0.000
		Subtotal	2.218	2.887		2.255		2.825		-		2.825	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - ES C - Engineering Support	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.100	May 2018	0.085	Dec 2018	0.329	Nov 2019	-		0.329	Continuing	Continuing	0.000
MODPROT - ES C - Engineering Support #2	MIPR	Edgewood Chemical Biological Center	0.000	0.164	May 2018	0.137	Dec 2018	0.463	Nov 2019	-		0.463	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		(ECBC) : Aberdeen Proving Ground, MD													
MODPROT - ES C - Engineering support #3	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.000		0.000		0.082	Nov 2019	-		0.082	Continuing	Continuing	0.000
MODPROT - ES C - Engineering Support #4	MIPR	US Army Natick Soldier RD&E Center : Natick, MA	0.000	0.061	May 2018	0.108	Dec 2018	0.191	Nov 2019	-		0.191	Continuing	Continuing	0.000
		Subtotal	0.000	0.325		0.330		1.065		-		1.065	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - DTE C - M93 GPFU Environmental & EMI Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.008	Dec 2018	0.205	Nov 2019	-		0.205	Continuing	Continuing	0.000
MODPROT - DTE C - M98 Guard Bed	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren Center : Dahlgren, VA	0.000	0.000		0.069	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - OTE C - VFP Hose Refresh	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.000		0.000		0.040	Nov 2019	-		0.040	Continuing	Continuing	0.000
MODPROT - DTE C - M98 guard bed testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.000		0.000		0.135	Nov 2019	-		0.135	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JECP - DTE C - Improved M98 Filter Set Developmental Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.460	Feb 2018	0.162	Dec 2018	0.350	Nov 2019	-		0.350	Continuing	Continuing	0.000
		Subtotal	0.000	0.460		0.239		0.730		-		0.730	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - SBIR/STTR Reduction	Various	TBD : TBD	0.000	0.000		0.024	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - PM/MS S - Program Management Support	Various	Various : Various	0.000	0.000	Jul 2018	0.056	Dec 2018	0.804	Nov 2019	-		0.804	Continuing	Continuing	0.000
JECP - SBIR/STTR - Reduction	Various	TBD : TBD	0.000	0.000		0.106	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
JECP - PM/MS S - Program Management Support	MIPR	Various : Various	0.613	0.920	Jan 2018	0.446	Dec 2018	0.331	Nov 2019	-		0.331	Continuing	Continuing	0.000
		Subtotal	0.613	0.920		0.632		1.135		-		1.135	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.831	4.592		3.456		5.755		-		5.755	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

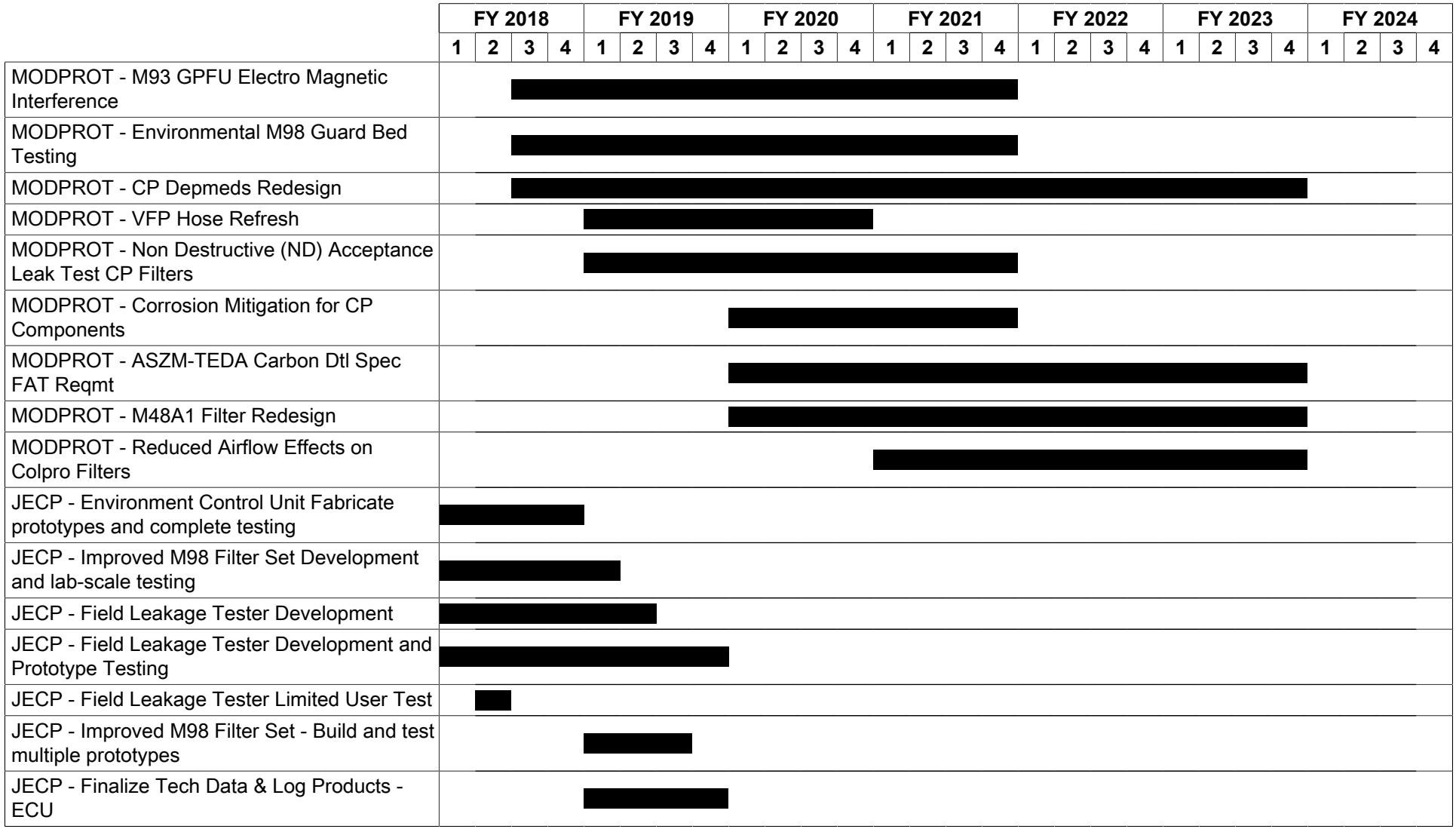

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

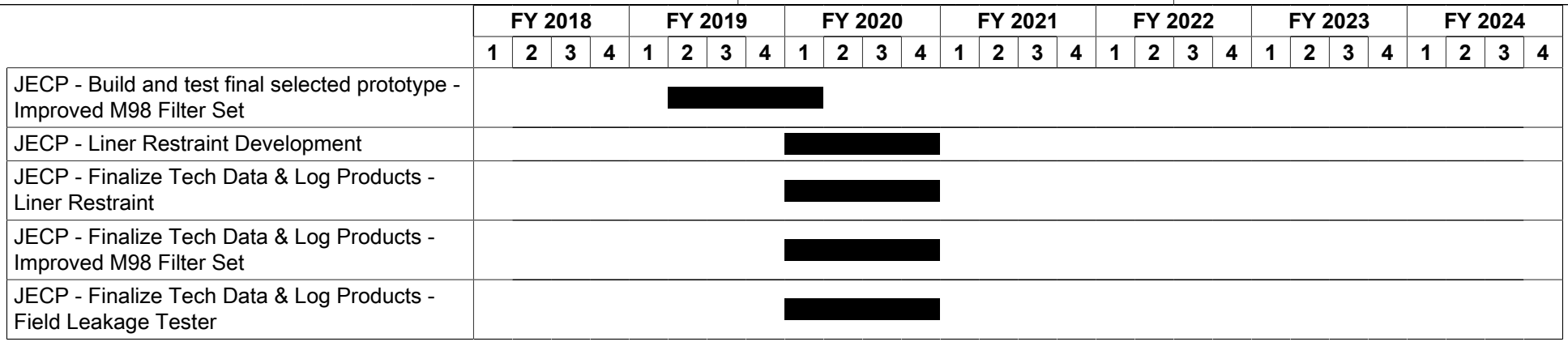

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** C07 / *COLLECTIVE PROTECTION (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MODPROT - M93 GPFU Electro Magnetic Interference	3	2018	4	2021
MODPROT - Environmental M98 Guard Bed Testing	3	2018	4	2021
MODPROT - CP Depmeds Redesign	3	2018	4	2023
MODPROT - VFP Hose Refresh	1	2019	4	2020
MODPROT - Non Destructive (ND) Acceptance Leak Test CP Filters	1	2019	4	2021
MODPROT - Corrosion Mitigation for CP Components	1	2020	4	2021
MODPROT - ASZM-TEDA Carbon Dtl Spec FAT Reqmt	1	2020	4	2023
MODPROT - M48A1 Filter Redesign	1	2020	4	2023
MODPROT - Reduced Airflow Effects on Colpro Filters	1	2021	4	2023
JECP - Environment Control Unit Fabricate prototypes and complete testing	1	2018	4	2018
JECP - Improved M98 Filter Set Development and lab-scale testing	1	2018	1	2019
JECP - Field Leakage Tester Development	1	2018	2	2019
JECP - Field Leakage Tester Development and Prototype Testing	1	2018	4	2019
JECP - Field Leakage Tester Limited User Test	2	2018	2	2018
JECP - Improved M98 Filter Set - Build and test multiple prototypes	1	2019	3	2019
JECP - Finalize Tech Data & Log Products - ECU	1	2019	4	2019
JECP - Build and test final selected prototype - Improved M98 Filter Set	2	2019	1	2020
JECP - Liner Restraint Development	1	2020	4	2020
JECP - Finalize Tech Data & Log Products - Liner Restraint	1	2020	4	2020
JECP - Finalize Tech Data & Log Products - Improved M98 Filter Set	1	2020	4	2020
JECP - Finalize Tech Data & Log Products - Field Leakage Tester	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) DE7 / *DECONTAMINATION SYSTEMS (OSD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
DE7: *DECONTAMINATION SYSTEMS (OSD)*	-	0.000	0.085	1.942	-	1.942	0.636	0.636	0.636	0.636	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 (MODPROT) Decontamination (Decon)

Efforts in the MODPROT Decon will address obsolescence and technical data concerns, beginning with the 1) Joint Services Transportable Decontamination System-Small Scale (M26 JSTDS-SS) through validation and verification of technical manual changes as well as technical data for spare and repair parts; 2) the Power Driven Decontamination Apparatus (M12A1 PDDA) by updating technical references and performing the necessary validation and verification before publishing an updated technical manual; and 3) 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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Modernization Decontamination	-	0.085	1.942
Description: Supports developmental efforts to upgrade systems in the Department of Defense (DoD) Chemical Biological Defense Program that have been fielded or have received approval for full rate production.			
FY 2019 Plans: Conduct market research and parts modeling for the modernization and upgrade of contamination mitigation systems and Transportable Decontamination defense systems. Complete technical manual and technical data package updates incorporating the system changes.			
FY 2020 Plans: 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. Update inaccuracies and conduct validation/ verification for Joint Services Transportable Decontamination System-Small Scale (M26 JSTDS-SS) Technical Manual. Provide			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** DE7 / *DECONTAMINATION SYSTEMS (OSD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
technical data for spares and repair parts for M26 JSTDS-SS Technical Data Package. Clarify procedures; update technical references and conduct validation/verification for Power Driven Decontamination Apparatus (M12A1 PDDA) Technical Manual. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.			
Accomplishments/Planned Programs Subtotals	-	0.085	1.942

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MODERNIZATION PROTECTION (MODPROT)

Modernization Decontamination (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 to be used in engineering change proposals and provided to the item managers.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) DE7 / *DECONTAMINATION SYSTEMS (OSD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - TD/D S - Tech Data Package Update	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.000		0.074	Dec 2018	0.412	Nov 2019	-		0.412	Continuing	Continuing	0.000
MODPROT - TD/D C - Tech Manual Updates	MIPR	Edgewood Chemical Biological Center (ECBC) : Rock Island, IL	0.000	0.000		0.000	Dec 2018	0.445	Nov 2019	-		0.445	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		0.074		0.857		-		0.857	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - OTE S - Bio Capability Testing	Various	Various : Various	0.000	0.000		0.000		0.670	Nov 2019	-		0.670	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		0.000		0.670		-		0.670	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - PM/MS C - Management Support	Various	TBD : TBD	0.000	0.000		0.008	Dec 2018	0.415	Nov 2019	-		0.415	Continuing	Continuing	0.000
MODPROT - SBIR/STTR Reduction	Various	TBD : TBD	0.000	0.000		0.003	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	0.000	0.000		0.011		0.415		-		0.415	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.085		1.942		-		1.942	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) DE7 / *DECONTAMINATION SYSTEMS (OSD)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** DE7 / *DECONTAMINATION SYSTEMS (OSD)*

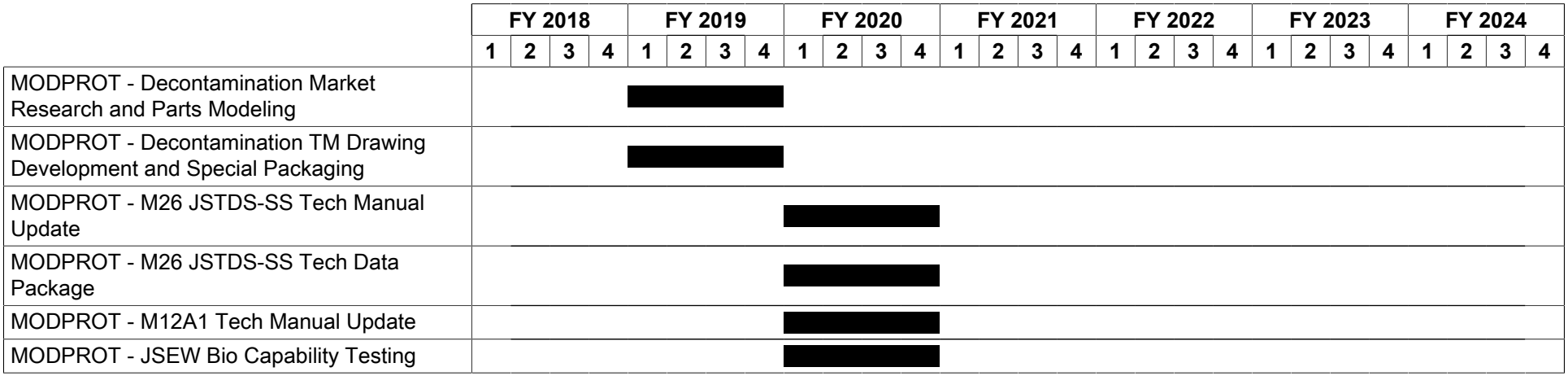

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** DE7 / *DECONTAMINATION SYSTEMS (OSD)*

Schedule Details

	Start		End	
Events	**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 - M26 JSTDS-SS Tech Manual Update	1	2020	4	2020
MODPROT - M26 JSTDS-SS Tech Data Package	1	2020	4	2020
MODPROT - M12A1 Tech Manual Update	1	2020	4	2020
MODPROT - JSEW Bio Capability Testing	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*				Project (Number/Name) IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
IP7: *INDIVIDUAL PROTECTION (OP SYS DEV)*	-	2.134	2.056	6.080	-	6.080	6.492	8.482	8.461	8.460	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 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 modernize current chemical protective footwear by conducting Limited User Evaluation (LUE) in support of the Alternative Source Qualification test and evaluation approach for a suitable replacement to the Alternative Footwear Solutions (AFS). MODPROT IP will also conduct modernization efforts and reverse engineering of maintenance and repair procedures for the Joint Services Mask Leakage Tester (JSMLT).

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 Force (SOF) Enterprise and other Joint Force enabling units. SPU RCDD mitigates risk across the CBDP by creating a portfolio of operationally-relevant 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 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.

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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) MODPROT Individual Protection (IP) ***Description:*** AFS and MALO LUE and improvements to JSMLT ***FY 2019 Plans:*** Continue modernization of the Joint Service Mask Leakage Tester (JSMLT). ***FY 2020 Plans:*** Continue modernization of the Joint Service Mask Leakage Tester (JSMLT). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	1.188	0.129	1.490
Title: 2) SPU RCDD ***Description:*** Modernization of IFS & CB Protective Glove. The Integrated Footwear System (IFS) is a Chemical Biological (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 POL and flame protection. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project is new start effort in FY 2020.	-	-	2.994
Title: 3) JSGPM ***Description:*** Product Qualification and Integration testing ***FY 2019 Plans:*** Continue Product Qualification Testing (PQT) of the Cobalt-Zinc, zirconium hydroxide, Argentum (Silver), TEDA (triethylene diamine) (CoZZAT) technology and begin the Metal Organic Framework (MOF) integration into the M61 filter. Initiate Next Generation Filter Developmental Testing (DT). ***FY 2020 Plans:***	0.946	1.927	1.596

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. Continue Next Generation Filter Developmental Testing (DT). Evaluate JSGPM suit interface and communication improvements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Accomplishments/Planned Programs Subtotals	2.134	2.056	6.080

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• JI0003: *JOINT SERVICE GENERAL PURPOSE MASK (JSGPM)*	53.154	16.927	13.209	-	13.209	12.499	25.193	3.891	0.000	0.000	124.873

Remarks

D. Acquisition Strategy

MODERNIZATION PROTECTION (MODPROT)

Modernization Individual Protection (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)

SOF RCDD plans to execute non-traditional programs for capabilities identified by Joint Special Operations Command (JSOC), select elements from across the Special Operations Force (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) effort is using the two M61 filter contracts awarded to 3M and Avon to develop improved filters for the JSGPM. There is a continual technology refreshment CLIN on both contracts that allow for filter development tasks to be awarded. The tasks can be competed between the two awardees or awarded to both to ensure competition on future spares and delivery orders. In addition, the new M53A1 mask system contract includes a continual technology refreshment CLIN to develop improvements of mask system performance in air purifying, powered air purifying, and supplied air operational modes for both military and domestic response mission requirements. As technologies transition from the Defense Threat Reduction Agency (DTRA) and Joint Science and Technology Office (JSTO), the technologies will be matured from system/subsystem prototyping demonstration technologies at Technology Readiness Level (TRL) 6 to actual system "mission proven" through successful mission operations in a mission environment at TRL 9. In addition to the maturing of the technology, the Manufacturing Readiness Level (MRL) of the technology requires maturing to MRL. The complexity of maturing all these different items requires an evolutionary approach with one prototype iteration governing the approach on the next iteration. With the criticality of the mask and filter systems, the production transition to the new improved systems has to be done with a high degree of confidence with risks mitigated to a low level.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - HW C - Product Development	Various	Various : Various	0.000	0.000		0.000		1.713	Dec 2019	-		1.713	Continuing	Continuing	0.000
JSGPM - HW C - Filter Prototypes #2 (C2A1)	C/CPFF	3M Canada : Brockville Ontario, CN	0.062	0.000		0.150	Jan 2019	0.080	Nov 2019	-		0.080	Continuing	Continuing	0.000
JSGPM - HW C - Filter Prototypes #2 (C2A1) #2	C/CPFF	AVON Protection Systems Inc. : Cadillac, MI	0.075	0.000		0.150	Jan 2019	0.080	Nov 2019	-		0.080	Continuing	Continuing	0.000
JSGPM - HW C - Filter Prototypes #1 (CoZZAT/ MOF)	C/CPFF	AVON Protection Systems Inc. : Cadillac, MI	1.471	0.090	Sep 2018	0.426	Dec 2018	0.300	Nov 2019	-		0.300	Continuing	Continuing	0.000
JSGPM - HW C - Filter Prototypes #1 (CoZZAT/ MOF) #2	C/CPFF	3M Canada : Brockville Ontario, CN	0.662	0.060	Sep 2018	0.244	Dec 2018	0.300	Nov 2019	-		0.300	Continuing	Continuing	0.000
		Subtotal	2.270	0.150		0.970		2.473		-		2.473	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SPU RCDD - ES C - Technical Support	Various	Various : Various	0.000	0.000		0.000		0.299	Nov 2019	-		0.299	Continuing	Continuing	0.000
JSGPM - ES C - IPT, Program, Engineering, and Technical Support	MIPR	Various : Various	0.226	0.076	Apr 2018	0.053	Dec 2018	0.072	Nov 2019	-		0.072	Continuing	Continuing	0.000
		Subtotal	0.226	0.076		0.053		0.371		-		0.371	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - OTE S - MALO Shelf Life Testing	C/FFP	Defense Technical Information Center (DTIC) : Fort Belvoir, VA	0.000	0.026	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - OTE S - JSMLT Transportation Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.021	May 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
MODPROT - OTE S - JSMLT Modernization	C/FFP	HAMILTON ASSOCIATES : INC. DBA AIR TECHN, OWINGS MILLS, MD	0.000	1.141	Jun 2018	0.113	Dec 2018	1.172	Nov 2019	-		1.172	Continuing	Continuing	0.000
SPU RCDD - DTE C - Test and Evaluation	MIPR	Various : Various	0.000	0.000		0.000		0.500	Dec 2019	-		0.500	Continuing	Continuing	0.000
JSGPM - DTE C - System Filters (CoZZAT)	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	1.650	0.128	Nov 2017	0.515	Jan 2019	0.423	Nov 2019	-		0.423	Continuing	Continuing	0.000
JSGPM - DTE C - USFK Dependent Escape Mask Prototype Testing	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.165	Mar 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JSGPM - DTE C - SPARK project to improve Q261 canister test equipment	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.065	Jul 2018	0.000		0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	1.650	1.546		0.628		2.095		-		2.095	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MODPROT - PM/MS S - Program Management Support	MIPR	Various : Various	0.000	0.000		0.011	Dec 2018	0.318	Nov 2019	-		0.318	Continuing	Continuing	0.000
MODPROT - SBIR/STTR Reduction	Various	TBD : TBD	0.000	0.000		0.005	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
SPU RCDD - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.482	Nov 2019	-		0.482	Continuing	Continuing	0.000
JSGPM - PM/MS C - Program Management and Technical Support	MIPR	Various : Various	1.597	0.362	Nov 2017	0.317	Dec 2018	0.341	Nov 2019	-		0.341	Continuing	Continuing	0.000
JSGPM - SBIR/STTR Reduction	Various	TBD : TBD	0.000	0.000		0.072	Oct 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	1.597	0.362		0.405		1.141		-		1.141	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.743	2.134		2.056		6.080		-		6.080	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

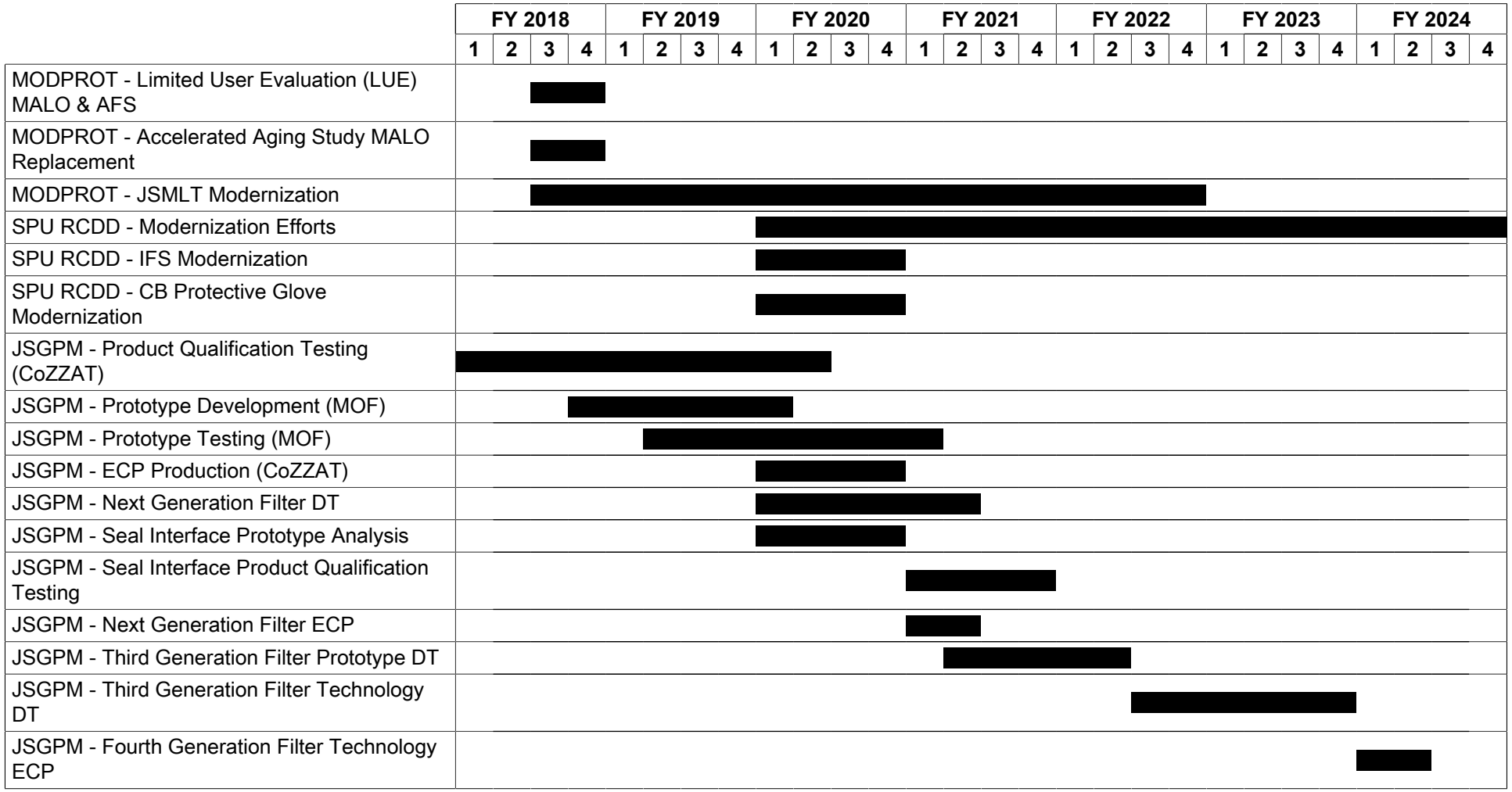

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IP7 / *INDIVIDUAL PROTECTION (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MODPROT - Limited User Evaluation (LUE) MALO & AFS	3	2018	4	2018
MODPROT - Accelerated Aging Study MALO Replacement	3	2018	4	2018
MODPROT - JSMLT Modernization	3	2018	4	2022
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)	1	2018	2	2020
JSGPM - Prototype Development (MOF)	4	2018	1	2020
JSGPM - Prototype Testing (MOF)	2	2019	1	2021
JSGPM - ECP Production (CoZZAT)	1	2020	4	2020
JSGPM - Next Generation Filter DT	1	2020	2	2021
JSGPM - Seal Interface Prototype Analysis	1	2020	4	2020
JSGPM - Seal Interface Product Qualification Testing	1	2021	4	2021
JSGPM - Next Generation Filter ECP	1	2021	2	2021
JSGPM - Third Generation Filter Prototype DT	2	2021	2	2022
JSGPM - Third Generation Filter Technology DT	3	2022	4	2023
JSGPM - Fourth Generation Filter Technology ECP	1	2024	2	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program											Date: March 2019	
Appropriation/Budget Activity 0400 / 7					R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*				Project (Number/Name) IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
IS7: *INFORMATION SYSTEMS (OP SYS DEV)*	-	11.923	15.051	16.811	-	16.811	16.133	14.916	12.993	12.993	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) Chemical Biological Radiological and Nuclear Information Systems (CBRN IS)
(2) Joint Effects Model 1 and 2 (JEM 1 and 2)
(3) Joint Warning and Reporting Network 1 and 2 (JWARN 1 and 2)
(4) Global Biosurveillance Portal (G-BSP)
(5) Software Support Activity (SSA).

CBRN IS will continue to modernize fielded capabilities throughout the lifecycle of the program to ensure compatibility with Service architectures, cloud-hosted environments, and system requirements, to include technical refresh of system hardware and software to maintain compatibility with new technologies and standards as well as cyber security and net centric policies. This will be integrated into a collaborative environment that allows users to collect and disseminate Chemical, Biological, Radiological, and Nuclear (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.

G-BSP will continue to train warfighters in the use of G-BSP, modernize critical hardware, and ensure compatibility of fielded capabilities. This will be integrated into a web-based enterprise environment that facilitates collaboration, communication, and information sharing in support of the detection, management, and mitigation of man-made and naturally occurring biological hazards. This will result in a set of tools and capabilities that facilitate the timely identification and detection of CBRN events in order to minimize operational impacts to the local and global populations.

JEM 1 and 2 will continue to update fielded JEM 1 and JEM 2 software due to changing Army, Navy, Air Force, Marine Corps, Special Operations Command (SOCOM), and National Guard Command and Control (C2) host architectures, systems, and standards in order to maintain interoperability and avert cyber threats and vulnerabilities to host C2 systems and perform test and evaluation of updated JEM 1 and JEM 2 baselines. This will be integrated into a web-based software application that supplies the Department of Defense (DoD) with the only operationally tested and accredited tool to effectively model and simulate the effects of Chemical, Biological, Radiological and Nuclear (CBRN) weapon strikes and incidents. This will provide warfighters with the ability to accurately model and predict the time-phased impact of CBRN and Toxic Industrial Chemical/Material (TIC/TIM) events and effects. Additionally, this will support planning efforts to mitigate the effects of Weapons of Mass Destruction (WMD) and to provide rapid estimates of hazards and effects integrated into the Common Operational Picture (COP).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

JWARN 1 and 2 will continue engineering, development, and modernization efforts to upgrade existing, operational JWARN systems in order to maintain interoperability, efficiency and functionality within the targeted C2 systems and Defense Information Systems Agency (DISA) milCloud CBRN IS enterprise site and conduct operational testing under utilizing the IT BOX construct and Agile Software development processes. Additionally, JWARN 1 and 2 will provide helpdesk and training support for fielded versions of JWARN 1 and 2 in all host environments. This will be integrated into an accredited DoD warning and reporting system that enables an immediate and integrated response to threats of contamination by WMD, CBRN and TIM incidents. This will provide a digital display of CBRN 1-6 reports on the COP, displayed through Service provided Command, Control, Communications, Computers, and Intelligence (C4I) systems resident at all echelons of command. Commanders will be provided with enhanced situational awareness throughout the area of operation, supports warfighter battle management and continuity of operations in a contaminated environment.

As software-intensive systems, JEM 2, JWARN 2, and G-BSP have no separately identifiable unit production components; unit cost calculations including Program Acquisition Unit Cost/Average Procurement Unit Cost (PAUC/APUC) and Operations and Sustainment (O&S) average annual per unit costs are not applicable.

The SSA will continue to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration, provide and update program of record integrated architectures and provide Net-Centric Policy implementation Assistance; and continue to maintain proper Cybersecurity/Information Assurance (CS/IA) accreditation of any system within the CBDP portfolio. This will provide the Chem-Bio Defense user developmental support and service organization to facilitate net-centric interoperability of systems in acquisition for the Warfighter.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) Global-BSP	1.753	2.649	2.904
Description: Modernization Efforts ***FY 2019 Plans:*** Continue to modernize/upgrade program cloud host provider hardware and maintain compatibility of previously delivered/fielded capabilities to ensure continuity of effort to the User. Perform refresher training and ongoing support at fielded locations. ***FY 2020 Plans:*** Continue to modernize program cloud host provider hardware and maintain compatibility of delivered and fielded capabilities to ensure continued usefulness to the Warfighter. Perform refresher training and ongoing support at Theater Special Operations Commands (TSOCs) co-located with the Geographic Combatant Commands (GCCs). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) Global-BSP	-	-	1.162
Description: Training and Logistics Support			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: Continue to perform Training Development, Integrated Logistic Support, and Configuration Management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 3) Global-BSP ***Description:*** Management Support ***FY 2020 Plans:*** Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	-	-	0.402
Title: 4) CBRN IS ***Description:*** Modernization Efforts ***FY 2019 Plans:*** Continue to modernize fielded capabilities throughout the lifecycle of the program to ensure compatibility with Service architectures, cloud-hosted environments, and system requirements, to include tech refresh of system hardware and software to maintain compatibility with new technologies and standards. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	0.284	2.352	1.841
Title: 5) JEM 1 and 2 ***Description:*** Command and Control (C2) Modernization Efforts ***FY 2019 Plans:***	2.095	1.795	0.895

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue to update fielded JEM 1 and JEM 2 software due to changing Army, Navy, Air Force, Marine Corps, SOCOM, and National Guard C2 host architectures, systems, and standards in order to maintain interoperability and avert cyber threats and vulnerabilities to host C2 systems. Perform test and evaluation of updated JEM 1 and JEM 2 baselines. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.			
Title: 6) JEM 1 and 2 ***Description:*** Pre-Planned Product Improvement (P3I) ***FY 2019 Plans:*** Continue to test and integrate fielded JEM 1 and 2 software with science and technology upgrades and model enhancements to improve JEM accuracy and precision. Improve architecture and overall performance of all JEM increments through software updates and deficiency resolution. Both increments of JEM software will be supported until all service C2 systems with JEM 1 software are fielded with JEM 2 software. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to change in program/project technical parameters.	2.402	3.597	1.737
Title: 7) JEM 1 and 2 ***Description:*** Training and Logistics Support ***FY 2020 Plans:*** Perform Training Development, Integrated Logistics Support and Configuration Management for upgraded fielded capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	1.675

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to change in program/project technical parameters.			
Title: 8) JEM 1 and 2 ***Description:*** Management Support ***FY 2020 Plans:*** Provide program/financial management, costing, contracting, scheduling, and acquisition oversight support to the fielded product baseline. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project technical parameters.	-	-	0.479
Title: 9) JWARN 1 and 2 ***Description:*** System Modernization/Update Development ***FY 2019 Plans:*** Continue engineering and development efforts to upgrade existing, operational JWARN Systems in order to maintain interoperability, efficiency and functionality within the targeted C2 systems while utilizing the IT BOX construct and Agile Software development processes. ***FY 2020 Plans:*** Continue engineering and development efforts to upgrade existing operational JWARN capabilities hosted on DISA milCloud CBRN IS enterprise site, Army Battle Command Common Services (BCCS) servers, Marine Corps Joint Tactical Common Operational Picture (COP) Workstation (JTCW) systems, Navy Consolidated Afloat Networks and Enterprise Services (CANES) Afloat and MOCs, in order to maintain interoperability, efficiency, and functionality within the targeted C2 systems while utilizing the IT Box construct and Agile software development practices. Provide any required patches or fixes to address potential issues discovered in the course of recurring system interoperability testing with service-specific C2 environments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	2.982	2.801	3.287
Title: 10) JWARN 1 and 2 ***Description:*** Program Management Support ***FY 2019 Plans:***	0.473	0.387	0.470

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue JWARN program financial management, scheduling, planning and reporting support to modernization effort under the IT BOX construct and Agile Software development processes. ***FY 2020 Plans:*** Continue JWARN 1 and 2 program financial management, scheduling, planning and reporting support to existing operational JWARN System Requirements Definition Package (RDP)-1 CDs hosted on RDP-2 CD 2.1 DISA milCloud CBRN IS enterprise site, CD 2.2 Army, CD 2.3 Marine Corps and CD 2.5 Navy C2 systems under the IT BOX construct and Agile Software development processes. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 11) JWARN 1 and 2 ***Description:*** IT BOX Test & Evaluation (T&E) ***FY 2019 Plans:*** Continue required Governmental developmental and operational testing on JWARN software updates and modernization efforts under the IT BOX construct and Agile Software testing processes. Conduct developmental and operational testing on JWARN software updates and modernization efforts to support Army's Common Operational Environment version 3 (COE v3). Develop training guides and courseware to reflect major upgrades to JWARN 2 in support of COE v3. ***FY 2020 Plans:*** Continue Government development test and evaluation of 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 National Guard C2 systems, in preparation for IOT&E on those systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.798	0.313	0.235
Title: 12) JWARN 1 and 2 ***Description:*** Training and Logistics Support ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	0.704

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Minor change due to routine program adjustments.			
Title: 13) SSA Policies, Standards and Guidelines ***FY 2019 Plans:*** Continue to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration. Update existing programs and register new programs in the Army Portfolio Management Solution/Army Information Technology Registry (APMS/AITR). ***FY 2020 Plans:*** Continue to support programs in the Interoperability and Supportability (I&S) certification, Information Support Plan (ISP), and Data and Service Exposure Verification and Registration. Update existing programs and register new programs in the Army Portfolio Management Solution/Army Information Technology Registry (APMS/AITR). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.222	0.246	0.244
Title: 14) SSA Integrated Architecture ***FY 2019 Plans:*** Continue to provide and update program of record integrated architectures and provide Net-Centric Policy implementation assistance. Continue to support CCSI updates. Continue to provide CCSI reference implementation. Support the enterprise tools and common capabilities to ensure relevance across CBRN programs. ***FY 2020 Plans:*** Continue to provide and update program of record integrated architectures and provide Net-Centric Policy implementation assistance. Continue to support CCSI updates. Continue to provide CCSI reference implementation. Support the enterprise tools and common capabilities to ensure relevance across CBRN programs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.254	0.253	0.317
Title: 15) SSA Chemical, Biological, Radiological, Nuclear (CBRN) Data Model ***FY 2019 Plans:*** 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. ***FY 2020 Plans:***	0.237	0.236	0.459

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 16) SSA Cybersecurity/Information Assurance (CS/IA) ***FY 2019 Plans:*** Continue to maintain proper Cybersecurity/Information Assurance (CS/IA) accreditation of any system within the CBDP portfolio throughout its life-cycle. This includes periodic re-accreditation of JPEO CBDP systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	0.423	0.422	-
Accomplishments/Planned Programs Subtotals	11.923	15.051	16.811

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

BIOSURVEILLANCE PORTAL (BSP)

The Global-Biosurveillance Portal (Global-BSP) program will continue to meet the requirements as set forth in the USSOCOM Information Systems Capability Development Document (IS CDD), 19 May 2014. The Global-BSP program will utilize the JROC's "IT Box" construct for program requirements, management, and development. The intent is to provide the next generation of capability with current and future technologies in less time and fielding products to the DoD utilizing an incremental delivery approach. IT Box enables programs to tailor the incrementally fielded software program model in the DODI 5000.02 to conduct multiple, more frequent fielding events in lieu of a single fielding event. Capabilities will be developed and delivered in a series of Capability Drops (CDs). There are two planned Production Capability Drops and two Engineering Capability Drops planned in each FY. Developmental Testing (DT) and end-to-end tests (E2E) will be conducted for each CD to verify capabilities prior to delivery to the Warfighter. User Feedback Events (UFEs) will be conducted with identified Users to elicit feedback on developed capabilities and input on required adjustments to address new technologies. Initial Operational Capability (IOC) was achieved in July 2016. A Full Operational Test & Evaluation will be conducted prior to Final Operational Capability to be delivered in 3QFY20. The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

CBRN INFORMATION SYSTEMS

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

CBRN-IS acquisition strategy utilizes a Family-of-Systems (FoS) approach to align multiple programs of record capabilities to the CBRN-IS architecture and operational environment. CBRN-IS enterprise will initially integrate appropriate JPEO-CBD products into a FoS framework beginning with the Joint Warning and Reporting (JWARN) and Joint Effects Model (JEM) program capabilities. 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 the inclusion of mature science and technology products and emerging technologies from existing ATD and experimental capability demonstrations (ECD). CBRN-IS utilizes the Agile software development process with the IT Box acquisition strategy to provide for the spiral development and fielding of modular capability packages.

JOINT EFFECTS MODEL (JEM)

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

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

As part of this strategy a single JEM 2 integrator, General Dynamics Information Technology (GDIT), was selected as the prime development contract in March 2017.

The current contractor for JEM 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1, CD 2.2, and CD 2.3 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The contract awarded in March 2017 includes scope for developing the remaining capabilities under the JEM 2 contract. The contract utilizes full and open competition and is referred to as the JEM 1 and 2 development, modernization and sustainment contract.

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

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

JOINT WARNING & REPORTING NETWORK (JWARN)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

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

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

The JWARN 2 Program will find an appropriate Sensor Connectivity Capability (SCC) to facilitate the transfer of CBRN sensor information from legacy CBRN sensors to DoD networks. This solution will be external to the CBRN Sensors and Service-identified network transmission device(s).

The current contractor for JWARN 2, Northrup Grumman, will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1) and RDP-2 documents.

As part of the strategy for a single JWARN 2 integrator, a follow-on contract was awarded in December 2018. The follow-on contractor, DCS Corp, for JWARN 2 will provide all capabilities defined in the Requirement Definition Package 1 (RDP-1), Capability Drop 1.1 (CD 1.1), Capability Drop 1.2 (CD 1.2), and RDP-2 / CD 2.1 documents. It is anticipated that the JRO will release further RDP-1 CDs, RDP-3, and RDP-4 prior to contract completion. The follow-on contract in FY18 will include scope for developing the remaining capabilities under the JWARN contract. The JWARN 2 follow-on contract will utilize full and open competition and will be referred to as the JWARN 2 software development and maintenance contract.

The maintenance/sustainment of the capability as an IT system will continue within CBRN IS in FY23.

SOFTWARE SUPPORT ACTIVITY (SSA)

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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - SW S - Global-BSP Modernization	MIPR	Various : Various	0.000	1.753	Dec 2017	2.649	Dec 2018	2.904	Dec 2019	-		2.904	Continuing	Continuing	0.000
JEM - SW S - Increment 2 - Modernization	C/CPAF	General Dynamics Information Technologies : Fairfax, VA	2.928	4.497	Apr 2018	5.392	Apr 2019	2.632	Apr 2020	-		2.632	Continuing	Continuing	0.000
JWARN - 1- SW S - Modernization	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	13.003	0.568	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 1-SW S- Modernization	C/CPAF	DCS Corps : Alexandria, VA	0.000	0.000		0.000		0.699	Dec 2019	-		0.699	Continuing	Continuing	0.000
JWARN - 2- SW S - Modernization	C/CPAF	Northrop Grumman Corp. : Winter Park, FL	1.901	2.414	Dec 2017	0.000		0.000		-		0.000	Continuing	Continuing	0.000
JWARN - 2- SW S - Modernization Follow-On	C/CPAF	DCS Corps : Alexandria, VA	0.000	0.000		2.801	Dec 2018	2.589	Dec 2019	-		2.589	Continuing	Continuing	0.000
SSA - SW S - Development Services	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.186	0.445	Dec 2017	0.444	Dec 2018	0.459	Dec 2019	-		0.459	Continuing	Continuing	0.000
		Subtotal	21.018	9.677		11.286		9.283		-		9.283	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.000		0.000		1.162	Dec 2019	-		1.162	Continuing	Continuing	0.000
CBRN IS - ES S - milCloud support	MIPR	Various : Various	0.000	0.284	Dec 2017	2.352	Dec 2018	1.841	Dec 2019	-		1.841	Continuing	Continuing	0.000
JEM - ILS C - Training and Logistics Support	Various	Various : Various	0.000	0.000		0.000		1.675	Dec 2019	-		1.675	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JWARN - 1&2 - ES S - Modernization	MIPR	Various : Various	1.211	0.000		0.000		0.704	Nov 2019	-		0.704	Continuing	Continuing	0.000
SSA - TD/D C - Information Assurance Activities	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.179	0.268	Dec 2017	0.268	Dec 2018	0.428	Dec 2019	-		0.428	Continuing	Continuing	0.000
		Subtotal	4.390	0.552		2.620		5.810		-		5.810	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JWARN - 1- OTE S - FOT&E	MIPR	Various : Various	4.419	0.162	Nov 2017	0.000		0.050	Nov 2019	-		0.050	Continuing	Continuing	0.000
JWARN - 2- OTE S	MIPR	Various : Various	0.070	0.636	Dec 2017	0.313	Dec 2018	0.185	Dec 2019	-		0.185	Continuing	Continuing	0.000
SSA - OTHT S - Integration Verification and Valuation (IV&V)	MIPR	Space and Naval Warfare (SPAWAR) Systems Center : San Diego, CA	3.302	0.423	Dec 2017	0.445	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	7.791	1.221		0.758		0.235		-		0.235	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BSP - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.402	Dec 2019	-		0.402	Continuing	Continuing	0.000
JEM - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.479	Aug 2020	-		0.479	Continuing	Continuing	0.000
JWARN - PM/MS S - Program management	MIPR	Various : Various	1.705	0.473	Dec 2017	0.387	Dec 2018	0.469	Dec 2019	-		0.469	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SSA - PM/MS C - Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.133	Dec 2019	-		0.133	Continuing	Continuing	0.000
		Subtotal	1.705	0.473		0.387		1.483		-		1.483	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.904	11.923		15.051		16.811		-		16.811	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

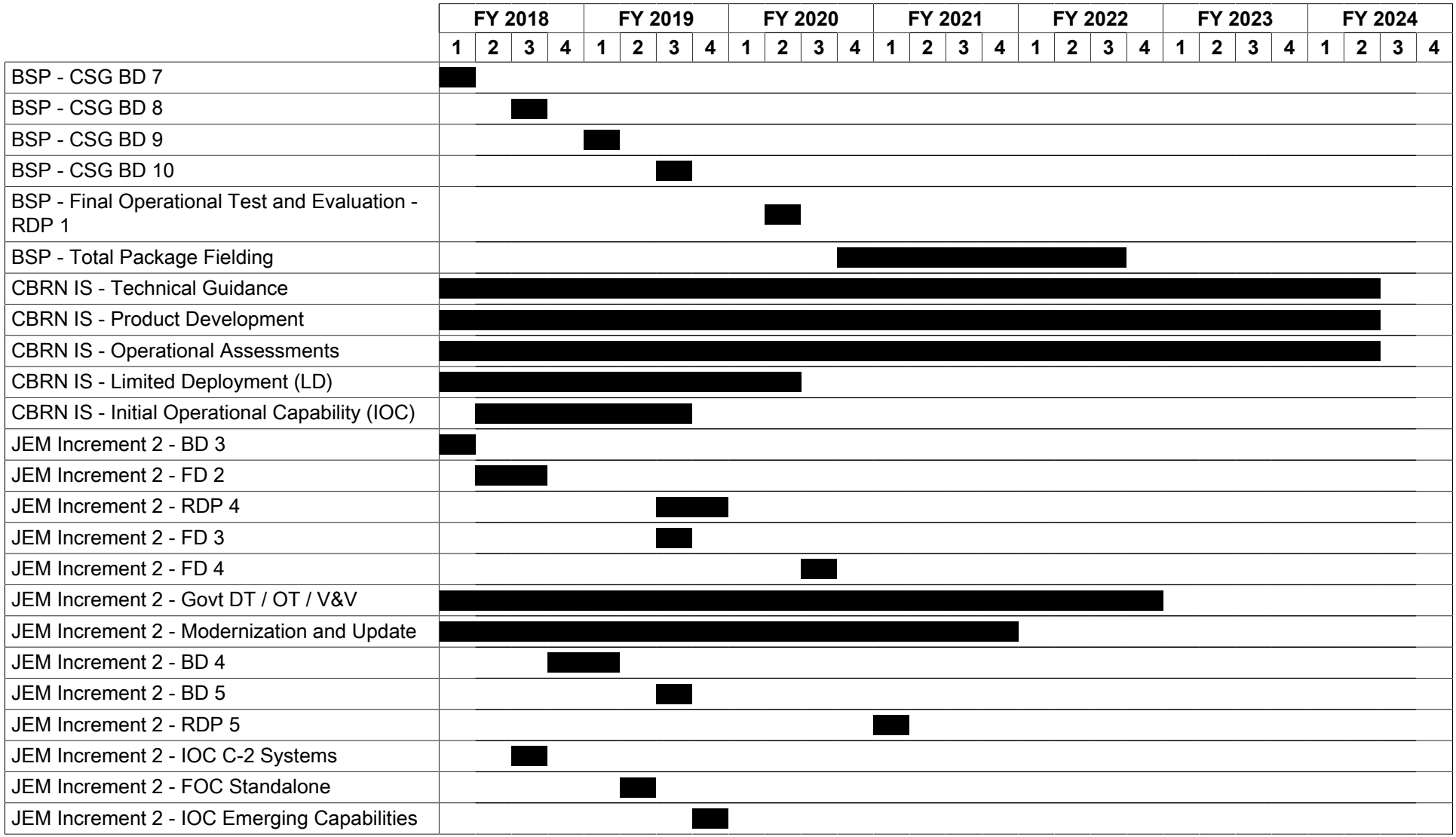

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

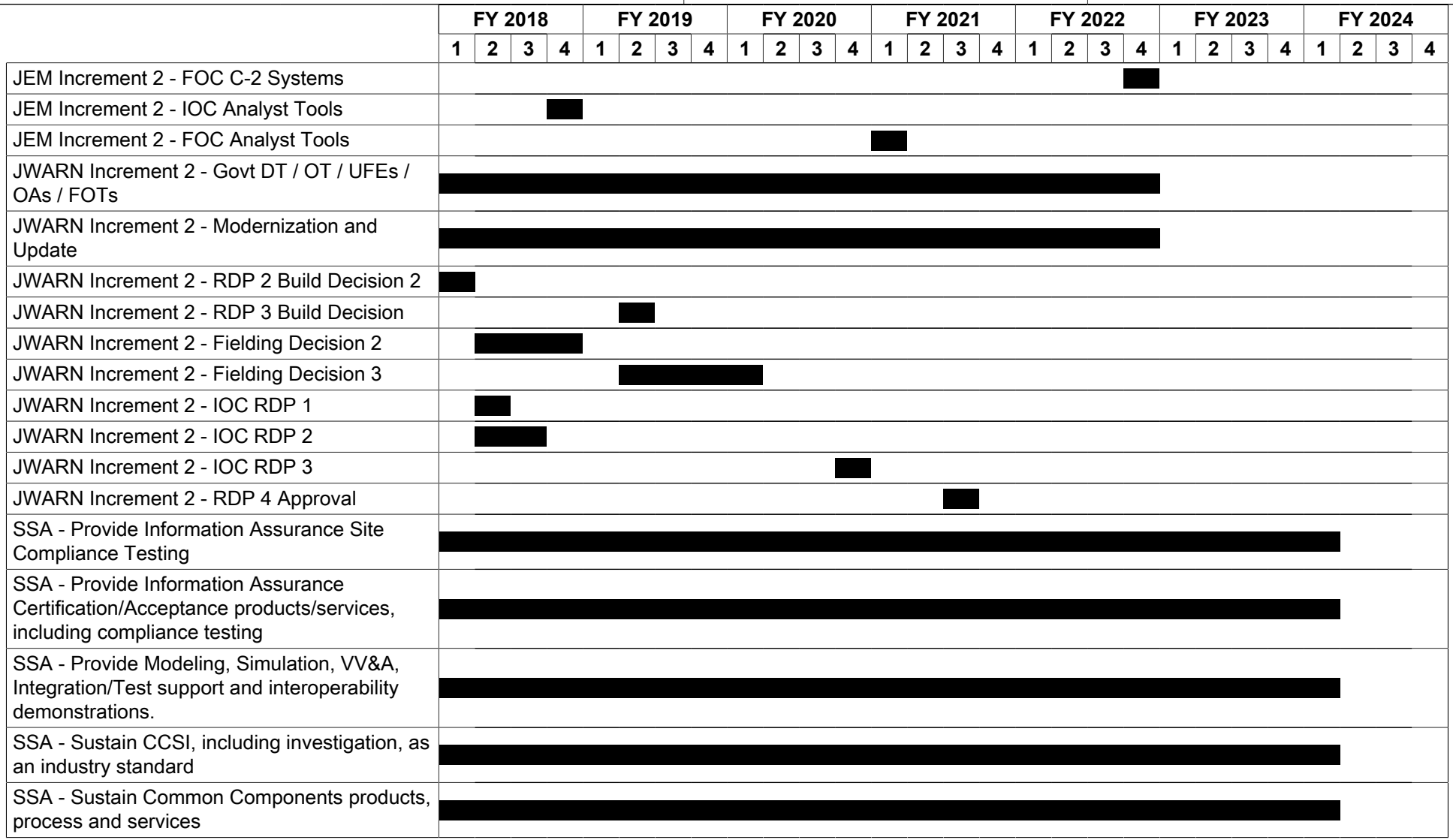

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

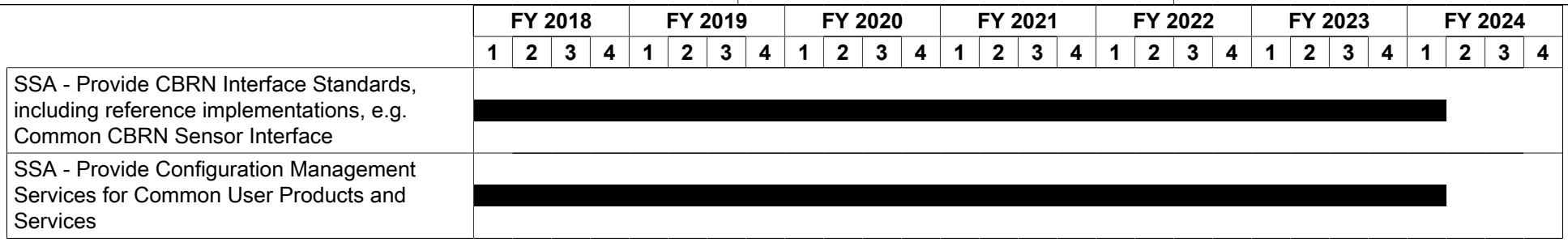

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BSP - CSG BD 7	1	2018	1	2018
BSP - CSG BD 8	3	2018	3	2018
BSP - CSG BD 9	1	2019	1	2019
BSP - CSG BD 10	3	2019	3	2019
BSP - Final Operational Test and Evaluation - RDP 1	2	2020	2	2020
BSP - Total Package Fielding	4	2020	3	2022
CBRN IS - Technical Guidance	1	2018	2	2024
CBRN IS - Product Development	1	2018	2	2024
CBRN IS - Operational Assessments	1	2018	2	2024
CBRN IS - Limited Deployment (LD)	1	2018	2	2020
CBRN IS - Initial Operational Capability (IOC)	2	2018	3	2019
JEM Increment 2 - BD 3	1	2018	1	2018
JEM Increment 2 - FD 2	2	2018	3	2018
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	2018	4	2022
JEM Increment 2 - Modernization and Update	1	2018	4	2021
JEM Increment 2 - BD 4	4	2018	1	2019
JEM Increment 2 - BD 5	3	2019	3	2019
JEM Increment 2 - RDP 5	1	2021	1	2021
JEM Increment 2 - IOC C-2 Systems	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** IS7 / *INFORMATION SYSTEMS (OP SYS DEV)*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JEM Increment 2 - FOC Standalone	2	2019	2	2019
JEM Increment 2 - IOC Emerging Capabilities	4	2019	4	2019
JEM Increment 2 - FOC C-2 Systems	4	2022	4	2022
JEM Increment 2 - IOC Analyst Tools	4	2018	4	2018
JEM Increment 2 - FOC Analyst Tools	1	2021	1	2021
JWARN Increment 2 - Govt DT / OT / UFEs / OAs / FOTs	1	2018	4	2022
JWARN Increment 2 - Modernization and Update	1	2018	4	2022
JWARN Increment 2 - RDP 2 Build Decision 2	1	2018	1	2018
JWARN Increment 2 - RDP 3 Build Decision	2	2019	2	2019
JWARN Increment 2 - Fielding Decision 2	2	2018	4	2018
JWARN Increment 2 - Fielding Decision 3	2	2019	1	2020
JWARN Increment 2 - IOC RDP 1	2	2018	2	2018
JWARN Increment 2 - IOC RDP 2	2	2018	3	2018
JWARN Increment 2 - IOC RDP 3	4	2020	4	2020
JWARN Increment 2 - RDP 4 Approval	3	2021	3	2021
SSA - Provide Information Assurance Site Compliance Testing	1	2018	1	2024
SSA - Provide Information Assurance Certification/Acceptance products/services, including compliance testing	1	2018	1	2024
SSA - Provide Modeling, Simulation, VV&A, Integration/Test support and interoperability demonstrations.	1	2018	1	2024
SSA - Sustain CCSI, including investigation, as an industry standard	1	2018	1	2024
SSA - Sustain Common Components products, process and services	1	2018	1	2024
SSA - Provide CBRN Interface Standards, including reference implementations, e.g. Common CBRN Sensor Interface	1	2018	1	2024
SSA - Provide Configuration Management Services for Common User Products and Services	1	2018	1	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MB7: *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*	-	11.195	9.021	3.720	-	3.720	3.365	2.887	2.179	7.552	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) Joint Biological Agent Identification and Diagostic System (JBAIDS)
(2) Next Generation Diagnostic System (NGDS)

JBAIDS is a commercial off the shelf system that provides a critical capability to identify bacterial and viral agents in environmental surveillance and clinical specimen sample types. The JBAIDS is reaching its end of life. Replacement of JBAIDS with NGDS Increment 1 began in 2017 and will achieve full replacement by the end of FY20.

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 Increment 1 improves diagnostic capabilities in deployable and laboratory-based combat health support units. NGDS Inc 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)	FY 2018	FY 2019	FY 2020
Title: 1) JBAIDS	0.019	0.018	0.489
Description: Program Management and Obsolescence Monitoring			
FY 2019 Plans: Continue to monitor obsolescence and Program, financial, acquisition, regulatory, and technical planning and oversight.			
FY 2020 Plans: Complete obsolescence and Program, financial, acquisition, regulatory, and technical planning and oversight.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program/project funding transferred to another funding line.			
Title: 2) NGDS 1	11.176	9.003	3.231
Description: System Upgrades & Support ***FY 2019 Plans:*** Continue development and upgrade of additional objective FDA cleared medical diagnostic assays, continue development of additional assays and sample validation protocols to meet JBAIDS equivalence. Continue annual cyber security updates and management of hardware and software configurations. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program/project transitioned to Production and Deployment Phase.			
Accomplishments/Planned Programs Subtotals	11.195	9.021	3.720

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

JOINT BIO AGENT IDENT AND DIAG SYSTEM (JBAIDS)

JBAIDS is a commercial off-the-shelf capability to identify multiple biological agents and other pathogens of operations concern, to include environmental and FDA cleared in vitro diagnostic assays. JBAIDS also has pre-positioned Emergency Use Authorizations assays for the identification of low probability, high consequence pathogens in clinical samples that can be deployed in the event of a declared health emergency. The JBAIDS program is preparing for full replacement by NGDS Increment 1 systems, beginning in FY17.

NEXT GENERATION DIAGNOSTICS SYSTEM (NGDS)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

The NGDS Increment 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.

The NGDS 2 program addresses CBR agents and COEs that the NGDS 1 Film Array does not address. More than one materiel solution is required to expand the scope of CBR agent diagnostics across multiple echelons of care. 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 initiated prototyping of a man-portable diagnostic capability in FY17, while continuing to conduct risk reduction efforts for the other capabilities. 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 anticipated to be cost-plus awards using Other Transactions Authority (OTA) agreements to take advantage of nontraditional Defense contractor offerings.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - NGDS 1 - HW C - Assay Development	C/CPFF	BioFire Dx : Salt Lake City, UT	10.759	3.400	Dec 2017	3.445	Nov 2018	2.123	Dec 2019	-		2.123	Continuing	Continuing	0.000
NGDS - HW C - Assay Development	MIPR	Battelle Memorial Institute : Aberdeen, MD	0.000	0.441	Nov 2017	0.200	Dec 2018	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - HW C - Assay Development #2	MIPR	Various : Various	0.000	0.641	Nov 2017	0.026	Jan 2019	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	10.759	4.482		3.671		2.123		-		2.123	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - ES S - Engineering Support	C/CPFF	BioFire Dx : Salt Lake City, UT	0.000	0.682	Nov 2017	0.150	Jun 2019	0.150	Jun 2020	-		0.150	Continuing	Continuing	0.000
		Subtotal	0.000	0.682		0.150		0.150		-		0.150	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JBAIDS - PM/MS S - Project Management	MIPR	Various : Various	1.756	0.019	Jan 2018	0.018	Jan 2019	0.489	Jan 2020	-		0.489	Continuing	Continuing	0.000
NGDS - PM/MS C - PM/MS - Program Management Support	Various	JPEO Chem/Bio Defense (JPEO-CBD) : Aberdeen Proving Ground, MD	0.000	0.394	Jan 2018	1.154	Jan 2019	0.234	Dec 2019	-		0.234	Continuing	Continuing	0.000
NGDS - PM/MS S - Product Management Support	MIPR	Various : Various	1.673	2.933	Jan 2018	1.189	Jan 2019	0.349	Dec 2019	-		0.349	Continuing	Continuing	0.000

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NGDS - PM/MS C - Program Management Support	MIPR	Edgewood Chemical Biological Center (ECBC) : Aberdeen Proving Ground, MD	0.000	0.554	Dec 2017	0.157	Nov 2018	0.162	Dec 2019	-		0.162	Continuing	Continuing	0.000
NGDS - PM/MS C - NGDS1 ADMC Support	C/CPFF	Ology : Alachua, FL	0.000	1.126	Dec 2017	1.092	Nov 2018	0.000		-		0.000	Continuing	Continuing	0.000
NGDS - PM/MS S - Program Management Support	Various	JPM Medical Countermeasure Systems (JPM MCS) : Fort Detrick, MD	4.288	1.005	Jan 2018	1.590	Jan 2019	0.213	Dec 2019	-		0.213	Continuing	Continuing	0.000
		Subtotal	7.717	6.031		5.200		1.447		-		1.447	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.476	11.195		9.021		3.720		-		3.720	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

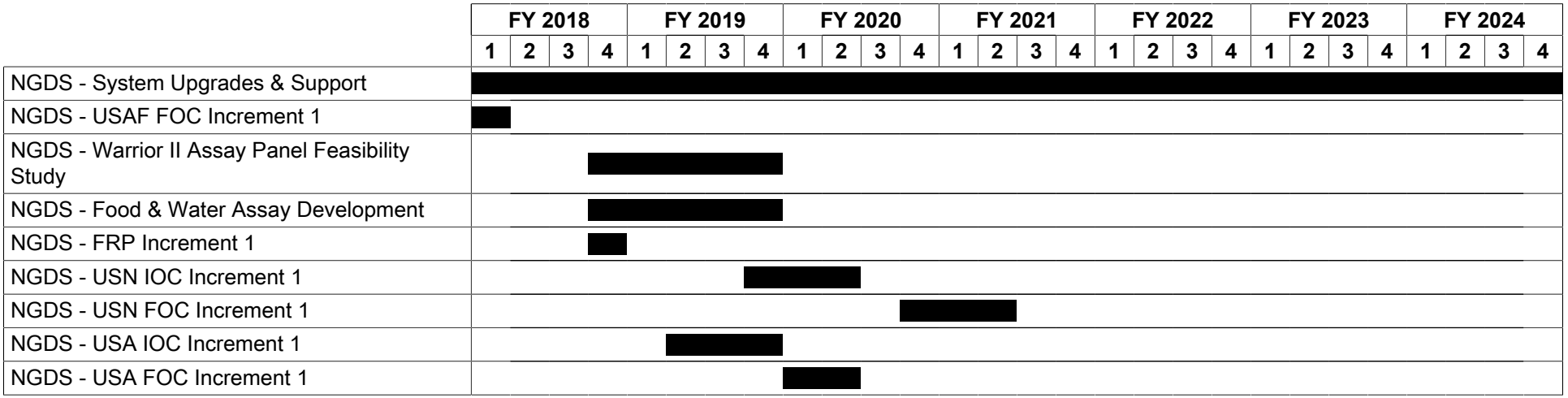

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MB7 / *MEDICAL BIOLOGICAL DEFENSE (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
NGDS - System Upgrades & Support	1	2018	4	2024
NGDS - USAF FOC Increment 1	1	2018	1	2018
NGDS - Warrior II Assay Panel Feasibility Study	4	2018	4	2019
NGDS - Food & Water Assay Development	4	2018	4	2019
NGDS - FRP Increment 1	4	2018	4	2018
NGDS - USN IOC Increment 1	4	2019	2	2020
NGDS - USN FOC Increment 1	4	2020	2	2021
NGDS - USA IOC Increment 1	2	2019	4	2019
NGDS - USA FOC Increment 1	1	2020	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) MC7 / *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
MC7: *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*	-	0.000	0.000	1.248	-	1.248	0.000	0.000	0.000	0.000	0.000	1.248
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 is:
(1) Improved Never Agent Treatment System (INATS)

INATS, which includes Food and Drug Administration (FDA) approved prophylactics, pre-treatments, and therapeutics, is intended to protect and/or sustain the Joint Service Member in a toxic chemical threat environment. 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 for the FDA-approved Soman Nerve Agent Pretreatment Pyridostigmine (SNAPP) product.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) INATS	-	-	1.248
Description: Studies required by the FDA and/or users to modernize or upgrade medical chemical defense countermeasures. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to change in program/project schedule.			
Accomplishments/Planned Programs Subtotals	-	-	1.248

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MC7 / *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*

D. Acquisition Strategy

IMPROVED NERVE AGENT TREATMENT SYSTEM (INATS)

Oxime Component - The development of a new and improved oxime, MMB4, (replacing 2-PAM) to treat current and emerging nerve agent threats, is one component of the INATS Development Program. Both the oxime and the centrally acting components are required to address the current and emerging nerve agent threat and to mitigate their effects. MMB4 is a relatively new chemical entity transitioning from Science and Technology Development. MMB4 requires the conduct of studies to resume the Phase 1 Clinical Trial, preparation for the Phase 2 clinical trials, the manufacturing of the drug product for both these trials, the conduct of non-clinical studies to determine toxicity, and the conduct of premonitory studies to determine the impact of nerve transmissions.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MC7 / *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
INATS - HW C - Non Clinical Studies PB	Various	TBD : TBD	0.000	0.000		0.000		1.248	Dec 2019	-		1.248	0.000	1.248	0.000
		Subtotal	0.000	0.000		0.000		1.248		-		1.248	0.000	1.248	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		1.248		-		1.248	0.000	1.248	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MC7 / *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*	

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
INATS - PB Studies										[redacted]																		

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** MC7 / *MEDICAL CHEMICAL DEFENSE (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
INATS - PB Studies	2	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program			Date: March 2019
Appropriation/Budget Activity 0400 / 7	R-1 Program Element (Number/Name) PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	Project (Number/Name) TE7 / *TEST & EVALUATION (OP SYS DEV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
TE7: *TEST & EVALUATION (OP SYS DEV)*	-	6.475	6.318	5.403	-	5.403	5.720	5.716	5.716	5.716	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides revitalization of existing instrumentation and technology upgrades to equipment at West Desert Test Center (WDTC) at Dugway Proving Ground (DPG), a Major Range and Test Facility Base (MRTFB), in support of their Chemical and Biological (CB) test mission.

Efforts included in the project are:
(1) T&E Upgrades (T&E UPGRAD)
(2) Biological Test Branch T&E Upgrade (BTB UPGRADE)

The T&E Upgrade effort supports upgrades to equipment for the Major Test Chambers Materiel Test Facility (MTF) which house the secondary containment modules (SCMs) for Non-Traditional Agent (NTA) testing, as well as other detector test chambers and Building 4165) at WDTC which houses the small item decontamination (SID) test fixture, swatch test fixtures, as well as several smaller labs (2) the CB Test Grid at WDTC which includes all dissemination, field referee equipment, and support equipment (generators, CP) and will include all upgraded test grid equipment transitioned from PD CCATTI and (3) the Combined Chemical Test Facility (CCTF) which includes the majority of chemical analytical equipment including Nuclear Magnetic Resonance (NMR) spectrometer, Gas Chromatograph (GC), GC-Mass Spectrometer (GC-MS), MS triple quads, Miniature Chemical Agent Monitoring System (MINICAMS), GASMETs, Liquid Chromatography MS (LCMS) and the majority of the laboratory hood space at WDTC.

BTB UPGRADE supports the MRTFB test mission of the Biological Test Branch (BTB) through instrumentation revitalization and technology upgrades to aging and obsolete equipment. These efforts maintain readiness at the BTB, which is the MRTFB's only laboratory equipped to test with aerosolized biosafety level-3 (BSL-3) agents. The BTB 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, and support (e.g., generators, collective protection) equipment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: 1) BTB UPGRADE	0.925	0.885	0.757
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continues to provide instrumentation and equipment to BTB-ECBC, in support of the CB Defense mission. Continues to provide for BSL-3 biological laboratory equipment for the Lother Solomon Test Facility (LSTF) Annex. Provides for enhancement of the biological decontamination capability. Provides for enhanced laboratory referee capability and management. ***FY 2020 Plans:*** Continues to provide instrumentation and equipment to BTB-ECBC, in support of the CB Defense mission. Continues to provide for BSL-3 biological laboratory equipment for the LSTF Annex. Provides for enhancement of the biological decontamination capability. Provides for enhanced laboratory referee capability and management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 2) WDTC - MRTFB ***Description:*** Major Test Chambers (MTF and Building 4165) ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	1.192	1.087	0.998
Title: 3) WDTC - MRTFB ***Description:*** CB Test Grid ***FY 2019 Plans:*** 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	1.352	1.358	1.132

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Test Grid provide near real time data analysis and rapid test adaptation to minimize costs and increase the effectiveness of field testing. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.			
Title: 4) WDTC - MRTFB ***Description:*** Combined Chemical Test Facility (CCTF) ***FY 2019 Plans:*** Provide continued revitalization and upgrade of existing instrumentation and equipment at the CCTF at WDTC in support of their chemical test mission. Continue upgrade of chemical laboratory fume hoods. Modernization will result in improved test fixtures which will reduce risk to personnel and provide improved test capabilities. Continue efforts to enhance NTA test capability in these fixtures. ***FY 2020 Plans:*** 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Minor change due to routine program adjustments.	3.006	2.988	2.516
Accomplishments/Planned Programs Subtotals	6.475	6.318	5.403

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

BIO TEST BRANCH T&E UPGRADE (BTB UPGRADE)

Exhibit R-2A, RDT&E Project Justification: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

Test and evaluation Range Instrumentation/Technology Upgrades is a continuing project. It provides for technical upgrades to Bio Test Branch (Edgewood Chemical Biological Center) capabilities for Biological testing of DoD CB materiel, weapons, and weapons systems from concept through production. Technical and Facility upgrades will utilize full and open competition as appropriate through ECBC contract resources.

T&E RANGE INSTRUMENT/TECH UPGRADE (T&E UPGRADE)

Test and evaluation Range Instrumentation/Technology Upgrades is a continuing project. It provides for technical upgrades to WDTC capabilities for Chemical and Biological testing of DoD CB materiel, weapons, and weapons systems from concept through production. Upgrades will utilize Military Interdepartmental Purchase Requests (MIPR) and contracts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BTB UPGRADE - OTHT S - T&E Upgrade	C/FFP	Various : Various	0.000	0.925	Mar 2018	0.885	Apr 2019	0.757	May 2020	-		0.757	Continuing	Continuing	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC Major Test Chambers (MTF and Building 4165)	MIPR	Various : Various	2.551	1.192	Mar 2018	1.087	Feb 2019	0.998	Feb 2020	-		0.998	Continuing	Continuing	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC CB Test Grid	MIPR	Various : Various	0.000	1.352	Mar 2018	1.358	Feb 2019	1.132	Feb 2020	-		1.132	Continuing	Continuing	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - WDTC CCTF	MIPR	Various : Various	0.000	0.490	Mar 2018	1.076	Feb 2019	2.516	Feb 2020	-		2.516	Continuing	Continuing	0.000
T&E UPGRAD - OTHT C - Technology Upgrade - CCTF Chemical Laboratory Fume Hoods	MIPR	Health and Human Services : Washington, DC	0.000	2.516	Jan 2018	1.912	Feb 2019	0.000		-		0.000	Continuing	Continuing	0.000
		Subtotal	2.551	6.475		6.318		5.403		-		5.403	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.551	6.475		6.318		5.403		-		5.403	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

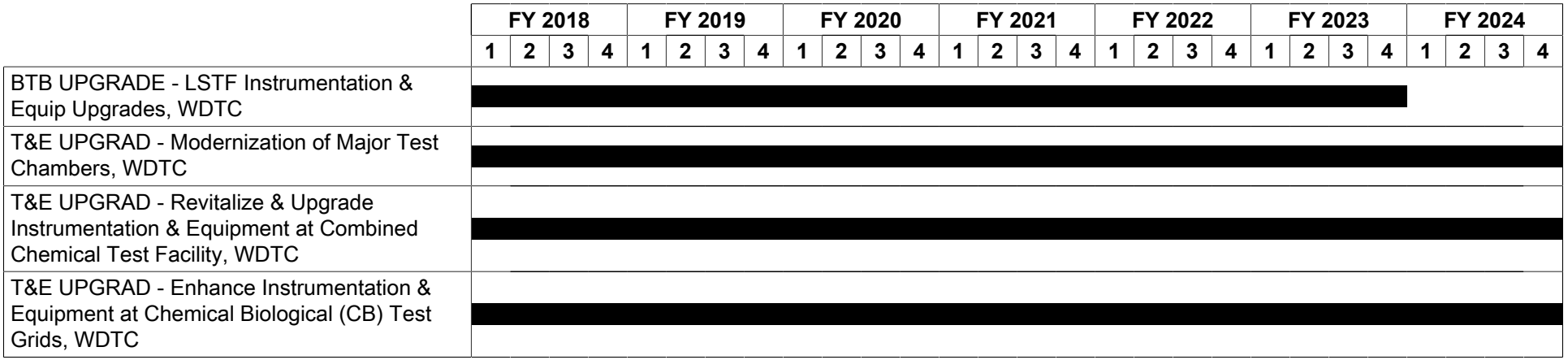

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Chemical and Biological Defense Program		Date: March 2019
Appropriation/Budget Activity 0400 / 7	**R-1 Program Element (Number/Name)** PE 0607384BP / *CHEMICAL/BIOLOGICAL DEFENSE (OP SYS DEV)*	**Project (Number/Name)** TE7 / *TEST & EVALUATION (OP SYS DEV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
BTB UPGRADE - LSTF Instrumentation & Equip Upgrades, WDTC	1	2018	4	2023
T&E UPGRAD - Modernization of Major Test Chambers, WDTC	1	2018	4	2024
T&E UPGRAD - Revitalize & Upgrade Instrumentation & Equipment at Combined Chemical Test Facility, WDTC	1	2018	4	2024
T&E UPGRAD - Enhance Instrumentation & Equipment at Chemical Biological (CB) Test Grids, WDTC	1	2018	4	2024

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