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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>
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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	-	29.619	17.230	6.254	1.085	7.339	6.124	6.319	5.809	5.939	0.000	78.379
<i>526: Marine Orien Log Eq Ad</i>	-	3.305	3.891	2.916	1.085	4.001	2.923	2.914	2.608	2.611	0.000	22.253
<i>EW8: Armored Engineer Vehicles</i>	-	11.712	1.482	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.194
<i>G11: Adv Elec Energy Con Ad</i>	-	4.982	6.331	3.338	-	3.338	3.201	3.405	3.201	3.328	0.000	27.786
<i>K39: Field Sustainment Support Ad</i>	-	2.332	2.308	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.640
<i>K41: Water And Petroleum Distribution - Ad</i>	-	3.954	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.954
<i>VR8: Combat Service Support Systems - Ad</i>	-	3.334	3.218	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.552

A. Mission Description and Budget Item Justification

This Program Element (PE) supports advanced component development and prototypes of new and improved technologies for combat support and combat service support equipment essential to sustaining combat operations. Advancements in bridging, electric power generators, material-handling, environmental control, shelter systems, cargo aerial delivery, field service systems, mortuary affairs equipment and petroleum equipment are necessary to improve safety and increase the tactical mobility, operational capability, lethality and survivability on the digital battlefield and to provide for greater sustainment while reducing the logistics support burden. Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, regulatory compliance and reliability of existing systems.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	35.333	14.248	14.387	-	14.387
Current President's Budget	29.619	17.230	6.254	1.085	7.339
Total Adjustments	-5.714	2.982	-8.133	1.085	-7.048
• Congressional General Reductions	-0.025	-0.018			
• Congressional Directed Reductions	-4.500	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	3.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.189	-			
• Adjustments to Budget Years	-	-	-8.133	1.085	-7.048

Change Summary Explanation

FY19 funding request was increased by \$3.00 million to support tactical electric program research for remote and forward operating bases
 FY 2020 funding requests was reduced by \$7.048 million to support the Army's modernization priorities in support of the National Defense Strategy.

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Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) 526 / <i>Marine Orien Log Eq Ad</i>			
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
526: <i>Marine Orien Log Eq Ad</i>	-	3.305	3.891	2.916	1.085	4.001	2.923	2.914	2.608	2.611	0.000	22.253
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports efforts and studies for advanced component development, including prototypes of equipment and sub-systems which provide critical capabilities for Unified Land Operations (ULO), by extending the Commander's available maneuver space into and throughout the littorals, inland waterways and near coastal regions. Army watercraft equipment enables the conduct of riverine, Logistics-over-the-Shore (LOTS) and Joint Logistics-over-the-Shore (JLOTS), inter and intra-theater transport, movement and maneuver, mission command and sustainment, as identified in DODD 5100.01 (Functions of the Department of Defense and its major components). Army Watercraft exploit the inland waterways and littoral regions as waterborne maneuver and supply routes, conducting operations through littoral entry points (developed, undeveloped, and austere access points) and in non-permissive, and/or denied access scenarios. The Army uses a spectrum of Army Watercraft systems, from heavy sustainment ocean going landing craft capable of intra-theater and ship to shore transport and undeveloped beach or harbor access, to oceangoing and harbor utility tug boats and barge derricks for transport and denied port/salvage operations, and modular causeway systems for (LOTS/JLOTS). The funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, regulatory compliance and reliability of existing systems. Funded efforts will address critical gaps in these areas for the current fleet, while at the same time researching, developing and testing emergent technologies. To support future acquisitions and future fleet planning, funding efforts which will include conducting trade studies, Business Case Analyses to inform the requirement development process, and support Analysis of Alternatives (AoA). The funding enables Army's compliance with the National Defense Authorization Act of 1996 and 502(6) of the Clean Water Act and compliance with Environmental protection Agency (EPA) emission standards.

FY20 funding supports modernization of the Legacy fleet wide systems by investigating technology insertions including, but not limited to: condition based maintenance, vessel electronics, Victory Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: At Sea Transfer Technology	2.158	2.150	1.026	-	1.026
Description: At Sea Transfer Technology enables roll on and roll off (RO/RO) capability from vessels at sea and causeway transport of vehicles and equipment to the beach or shore. The current effort serves to inform development of a Service Life Extension Program (SLEP) for the Modular Warping Tug (MWT) and Causeway Ferry (CF) which are principle working platforms in the Modular Causeway System (MCS).					
FY 2019 Plans:					

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orient Log Eq Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Complete SLEP design prototype; perform testing of MWT/CF SLEP prototype; and complete MWT/CF Production Level TDP.</p> <p>FY 2020 Base Plans: Perform testing of MWT/CF SLEP prototype and to complete Technical Data Package for a reference for the Maritime workforce.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: MWT initial design is planned for completion in FY19. FY20 will focus on the testing phase, which is anticipated to require a lower dollar value.</p>					
<p>Title: Environmental Compliance Projects</p> <p>Description: Environmental projects enable compliance with requirements as defined in law under Uniform National Discharge Standards (UNDS) and Environmental Protection Agency (EPA) emissions standards. The EPA reviews the UNDS Code of Federal Regulations (CFR) language in five-year increments separated into three batches (types of discharge). This is an ongoing assessment of statutory language which may or may not result in material solution change.</p> <p>FY 2019 Plans: Continue identification of Environmental Compliance Technologies IAW evolving statutory and regulatory requirements; continue MSD shipboard test and evaluation; continue OWS requirement and capability analysis; and continue Clean Ballast Water requirement and capability analysis.</p> <p>FY 2020 Base Plans: Identification of Environmental Compliance Technologies IAW evolving statutory and regulatory requirements and ensure ships are compliant. Will also fund Navy efforts for UNDS analysis and committee representation.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: The following UNDS efforts meet compliance standards and will conclude in FY19, thereby reducing funding requirements: - MSD shipboard test and evaluation. - OWS requirement and capability analysis. - Clean Ballast Water requirement and capability analysis.</p>	0.459	0.506	0.060	-	0.060
<p>Title: Force Protection Capability</p>	0.619	0.640	0.500	-	0.500

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B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<p>Description: Army Watercraft Systems (AWS) Force Protection capability is limited to defensive measures. Current efforts include development of gunner station and weapon station locations, integration of Common Remotely Weapon Station (CROWS) and non-lethal Escalation of Force (EoF). The EoF capability includes white light, green dazzler, an acoustic hailing device, percussion grenades, and Forward Looking Infra-Red (FLIR).</p> <p>FY 2019 Plans: Install and test CROWS aboard LSV-7 class.</p> <p>FY 2020 Base Plans: Will design, install, and test CROWS aboard LCU and LSV 7 class vessels.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Effort funding change due to economic adjustment - no significant change in work efforts.</p>					
<p>Title: Army Watercraft Program Support</p> <p>Description: Matrix Salary Support includes Program Management and System Engineering resources required to manage the program projects and provide contractor oversight. It also includes benefits, travel, personnel training and other Government costs required to retain a professional acquisition workforce.</p> <p>FY 2019 Plans: Provide engineering matrix Support and fund Navy for UNDS analysis and committee representation.</p> <p>FY 2020 Base Plans: Will provide MWT Engineering test support as well as engineering and Naval support for the Fleet.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: Effort funding change due to economic adjustment - no significant change in work efforts.</p>					
<p>Title: Trade Studies and Business Analyses</p> <p>Description: Conduct Affordability and Feasibility Studies to include support of Analysis of Alternatives for future vessel platforms.</p> <p>FY 2019 Plans:</p>					
	0.069	0.370	0.300	-	0.300
	-	0.100	1.030	-	1.030

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>			<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• MA4501: <i>MODIFICATION KITS</i>	20.980	25.201	34.587	4.234	38.821	16.407	16.840	16.354	7.393	0.000	141.996
• MA4502: <i>INSTALLATION OF MODIFICATIONS</i>	23.233	12.278	5.438	-	5.438	5.434	2.792	2.954	2.955	0.000	55.084
• M11101: <i>Army Watercraft Esp</i>	20.110	8.508	35.194	-	35.194	40.953	36.646	33.957	30.541	0.000	205.909
• ML5355: <i>Items Less Than \$5.0M (Float/Rail)</i>	2.877	8.385	6.920	-	6.920	1.846	-	-	-	0.000	20.028

Remarks

FY 2018 Accomplishments:

- Continue the development of the MWT/CF SLEP design solution; initiated prototype production.
- Continue EOF development on LSV CROWS.
- Completed identification of Environmental Compliance Technologies IAW evolving statutory and regulatory requirements.
- Material Sanitation Device (MSD) shipboard test and evaluation.
- Oil Water Separator (OWS) requirement and capability analysis.
- Clean Ballast Water requirement and capability analysis.

D. Acquisition Strategy

Leverage government and public research centers (TARDEC and Naval Surface Warfare Center (NSWC) Philadelphia) and known public research institutes (Battelle) along with associated contract mechanisms to prototype, test, and evaluate component technologies that may be applicable to the current and future Army Watercraft fleet.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army											Date: March 2019				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev					Project (Number/Name) 526 / Marine Oriented Log Eq Ad						

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Force Protection, Escalation of Force (EoF) Development (i.e. CROWS)	MIPR	TARDEC : Warren, MI	2.649	0.619	Jul 2018	0.640	Feb 2019	0.500	Feb 2020	-		0.500	Continuing	Continuing	-
At Sea Transfer Systems (Modular Warping Tug / Causeway Ferry)	SS/CPFF	TARDEC DTIC - I, Battelle : Fort Belvoir, VA	2.216	2.158	Aug 2018	2.150	Feb 2019	1.026	Nov 2019	-		1.026	Continuing	Continuing	-
Environmental Compliance Uniform National Discharge Standards (UNDS)	MIPR	Carderock : Maryland and Pennsylvania	2.822	0.459	Feb 2018	0.506	Jan 2019	0.060	Dec 2019	-		0.060	Continuing	Continuing	-
Trade Study Analyses	TBD	TBD : TBD	-	-		0.100	Sep 2019	1.030	Feb 2020	-		1.030	Continuing	Continuing	-
SEA FLIR Integration	MIPR	TARDEC : Warren, MI	-	-		-		0.000		1.085	Oct 2019	1.085	0.000	1.085	-
2019 SIBR/STTR Transfer	TBD	TBD : TBD	-	-		0.125		-		-		-	0.000	0.125	-
Subtotal			7.687	3.236		3.521		2.616		1.085		3.701	Continuing	Continuing	N/A

Remarks
 Significant Changes from FY19-20:
 -MWT initial design is planned for completion in FY19. FY20 will focus on the testing phase, which is anticipated to require a lower dollar value.
 -The following UNDS efforts meet compliance standards and will conclude in FY19:
 - MSD shipboard test and evaluation.
 - OWS requirement and capability analysis.
 - Clean Ballast Water requirement and capability analysis.
 - Trade Studies and Business Analyses from FY19-20 increases by adding human factor engineer analysis and initiation of electrical power studies to support C4ISR upgrades and joint operation capabilities for Legacy Vessels.

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Army Watercraft Program Support	MIPR	Detroit Arsenal PMs, TARDEC, NAVSEA Carderock :	1.358	0.069	Nov 2017	0.370	Dec 2018	0.300	Dec 2019	-		0.300	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orien Log Eq Ad</i>
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Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Maryland, Warren, MI													
Subtotal			1.358	0.069		0.370		0.300		-		0.300	Continuing	Continuing	N/A

Remarks
Matrix Employees are funded through a reimbursable MIPR and disbursed monthly.

	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		9.045	3.305		3.891		2.916		1.085	4.001	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orien Log Eq Ad</i>

Event Name	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
Army Watercraft Program Support																												
Force Protection: Common Remotely Operated Weapon Station																												
Force Protection: CROWS on LSV-1 Class																												
Force Protection: CROWS on LSV-7 Class																												
Force Protection: CROWS on LCU 2000 Class																												
At Sea Transfer Technology																												
Modular Warping Tug (MWT) / Causeway Ferry (CF)																												
MWT / CF - SLEP Development Contract																												
MWT / CF - SLEP Prototype and Proof Concept																												
MWT / CF - SLEP Testing																												
Environmental Compliance																												
Uniformed National Discharge Standards (UNDS)																												
UNDS Batch 2																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orien Log Eq Ad</i>

Event Name	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
UNDS Batch 3																	3											
Trade Studies and Business Analyses																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Army Watercraft Program Support	1	2018	4	2024
Force Protection: Common Remotely Operated Weapon Station (CROWS)	1	2018	4	2024
Force Protection: CROWS on LSV-1 Class	1	2018	3	2020
Force Protection: CROWS on LSV-7 Class	2	2019	4	2021
Force Protection: CROWS on LCU 2000 Class	1	2018	4	2024
At Sea Transfer Technology	1	2018	4	2024
Modular Warping Tug (MWT) / Causeway Ferry (CF)	1	2018	4	2021
MWT / CF - SLEP Development Contract	4	2018	4	2018
MWT / CF - SLEP Prototype and Proof Concept	1	2018	4	2020
MWT / CF - SLEP Testing	1	2020	4	2021
Environmental Compliance	1	2018	4	2024
Uniformed National Discharge Standards (UNDS)	1	2018	4	2022
UNDS Batch 2	4	2020	4	2020
UNDS Batch 3	4	2022	4	2022
Trade Studies and Business Analyses	4	2019	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>			
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
EW8: <i>Armored Engineer Vehicles</i>	-	11.712	1.482	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.194
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2020 funding cancelled for Armored Mobile Earthmover (AME) development

A. Mission Description and Budget Item Justification

This Project supports live fire test and evaluation, initial operational test and evaluation and production qualification testing of the Joint Assault Bridge (JAB).

FY 2020 funding cancelled for Armored Mobile Earthmover (AME) development.

Funding supports modernization of Army Bridging fleets by investigating technology insertions including, but not limited to: condition based maintenance, increased military load capacities, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes and testing to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Joint Assault Bridge (JAB)	11.712	-	-	-	-
Description: This effort funds the development and testing of the Joint Assault Bridge (JAB). The JAB provides the Army Mobility Augmentation Companies (MACs) and Armor Brigade Combat Teams (ABCTs) Brigade Engineer Battalions (BEBs) with a survivable, deployable and sustainable heavy assault bridging capability. The JAB System will provide a Gap Crossing Capability to cross wet or dry gaps and provide freedom of maneuver on the battlefield and keep pace with Abrams ABCT operations.					
Title: Armored Mobile Earthmover (AME)	-	1.435	-	-	-
Description: This effort funds the development and testing of the Armored Mobile Earthmover (AME). AME will replace the M9 Armored Combat Earthmover and will be primarily a mobility asset, enabling maneuver units during attacks and movements to contact. The AME will provide hasty survivability and counter-mobility capabilities to the maneuver units until more survivability and counter-mobility assets can move forward to support the maneuver force's defenses. It will operate with primarily medium and heavy mechanized forces but will be capable of supporting all combat forces and the full range of military operations.					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 Plans: Funding supports Analysis of Alternatives (AOA) study to be conducted by the Army Capabilities Integration Center.					
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 funding cancelled for Mobile Armored Combat Earthmover (MACE) development.					
Title: FY 2019 SBIR / STTR Transfer	-	0.047	-	-	-
FY 2019 Plans: SBIR / STTR					
FY 2019 to FY 2020 Increase/Decrease Statement: Adjusted for FY 2019 SBIR / STTR Transfer					
Accomplishments/Planned Programs Subtotals	11.712	1.482	-	-	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• GZ3001: <i>Joint Assault Bridge</i>	128.350	139.146	205.517	-	205.517	198.392	264.044	278.931	254.406	Continuing	Continuing

Remarks

D. Acquisition Strategy
Funding will support RDT&E efforts to support testing and follow-on production for Assault Bridging.

E. Performance Metrics
N/A

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
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Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Support	MIPR	Various : Various	-	0.779	Oct 2017	0.150	Oct 2018	-		-		-	0.000	0.929	-
Subtotal			-	0.779		0.150		-		-		-	0.000	0.929	N/A

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
AME Analysis of Alternatives (AOA)	C/FFP	TBD : TBD	-	-		1.285	Jan 2019	-		-		-	0.000	1.285	-
JAB Force Protection Development and Fabrication	SS/FFP	DRS SUSTAINMENT SYSTEMS, INC. : SAINT LOUIS, MO	-	2.084	Oct 2017	-		-		-		-	0.000	2.084	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.047		-		-		-	0.000	0.047	-
Subtotal			-	2.084		1.332		-		-		-	0.000	3.416	N/A

Remarks
\$2.37M increase to FY18 product developmental costs associated with post Live Fire testing Force Protection Enhancements / Live Fire Remediation.

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JAB Initial Operational Test & Evaluation (IOTE)	MIPR	Operational Test Command : Ft. Hood, TX	-	3.143	Mar 2018	-		-		-		-	0.000	3.143	-
JAB Production Qualification Testing (PQT)	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	-	3.936	Nov 2017	-		-		-		-	0.000	3.936	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
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Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
JAB Prototype Live Fire Validation	MIPR	Aberdeen Test Center : Aberdeen Proving Grounds, MD	-	1.500	Feb 2018	-		-		-		-	0.000	1.500	-
JAB Logistics Demonstration	TBD	Army Operational Test Command (AOTC) : Ft. Hood, TX	-	0.270	Aug 2018	-		-		-		-	0.000	0.270	-
Subtotal			-	8.849		-		-		-		-	0.000	8.849	N/A

Remarks
FY18 Test and Evaluations costs have also been adjusted to reflect actual test costs.

	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	-	11.712	1.482	-	-	-	0.000	13.194	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

Event Name	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
Joint Assault Bridge Development & Testing																												
Live Fire Test & Eval Force Protection Enhancements	█				LFT&E Force Protection Enhancements																							
Live Fire Remediation Testing					█				LF Remediation Testing																			
Live Fire Test & Eval	█				LFT&E																							
Production Qualification Test					█				PQT																			
Logistics Demonstration					█				Log Demo																			
Initial Operational Test & Eval					█				IOT&E																			
Full Rate Production																					█							
Armored Mobile Earthmover (AME)																												
AME - Analysis of Alternatives (AOA)					█				AOA																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Joint Assault Bridge Development & Testing	1	2016	1	2019
Live Fire Test & Eval Force Protection Enhancements	1	2017	3	2018
Live Fire Remediation Testing	1	2019	2	2019
Live Fire Test & Eval	4	2016	3	2018
Production Qualification Test	2	2018	1	2019
Logistics Demonstration	4	2018	1	2019
Initial Operational Test & Eval	2	2019	3	2019
Full Rate Production	1	2020	1	2020
Armored Mobile Earthmover (AME)	1	2018	4	2026
AME - Analysis of Alternatives (AOA)	2	2019	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>			
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
G11: <i>Adv Elec Energy Con Ad</i>	-	4.982	6.331	3.338	-	3.338	3.201	3.405	3.201	3.328	0.000	27.786
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports the Army Network Modernization Strategy Line of Effort #4, Command Post (CP). The technologies in this portfolio are specifically designed to target CP challenges to enable power resilience across the operational spectrum and to resolve issues with setup and tear-down times and with the CP mobility and footprint. Additionally, this project supports enablers of the Integrated Visual Augmentation System (IVAS) which is a priority technology for the Network and Soldier Lethality CFT's.

As the DoD's Lead Standardization Activity for Tactical Electric Power (TEP), Project Manager Expeditionary Energy & Sustainment Systems (PM E2S2) matures and integrates technology that will improve the next generation of standard tactical power sources in support of all Services. It supports technical maturation of TEP systems that will extend Army operational mission reach and duration in support of the Army Operating Concept and Multi-Domain Battle.

Funding supports modernization of the current Tactical Electric Power capability by investigating technology insertions including, but not limited to hybrid capabilities, light-weight power solutions, vehicle/tactical microgrid interoperability. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment an operational energy concepts.

FY20 funding will continue to support the Small Tactical Electric Power (STEP), Power Distribution Illumination System, Electrical (PDISE) and Command Post Integrated Infrastructure (CPI2) programs.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Contract Activity	1.982	-	0.620	-	0.620
Description: Continue maturation and integration of technology supporting the STEP, CPI2 and PDISE programs.					
FY 2020 Base Plans: Build infrastructure prototypes to enable optimized use of existing microgrid technologies. Build prototypes to integrate command post vehicle power with Tactical Electric Power systems. Build prototypes to validate feasibility of integrating energy storage with existing TEP systems to address areas of efficiency, reliability, and footprint. Perform front end analysis to assess viability of forward-deployed, mobile nuclear power plants.					
FY 2019 to FY 2020 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY20 efforts to build infrastructure prototypes to enable optimized use of existing microgrid technologies, build prototypes to integrate command post vehicle power with Tactical Electric Power systems, and build prototypes to validate feasibility of integrating energy storage with existing TEP systems accounted for the increase from FY19 which had no contract activity. This funding also is used to leverage external funding in collaborative efforts.					
<p>Title: Government System Test and Evaluation</p> <p>Description: Supports in house and external performance tests of concept hardware. Also supports evaluation of systems at Network Integration Evaluation (NIE). Also supports evaluation of systems at larger events such as AEWE and JWA.</p> <p>FY 2019 Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will support the TEP CPD. Specific efforts will include performance testing of hybrid energy power sources.</p> <p>FY 2020 Base Plans: Test and evaluate government developed hybrid architectures that will inform the STEP program. Validate performance of developed prototypes to identify and reduce risks of select technology elements of the STEP program.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY20 funding is higher than FY19 funding to cover additional test, demonstration, and user feedback on available technologies that support hybrid and microgrid programs across the TEP spectrum. These efforts will gauge suitability and effectiveness of candidate technologies for follow-on development.</p>	0.400	0.200	1.048	-	1.048
<p>Title: Other Contracts and Government agencies</p> <p>Description: Matrix engineering and analysis support for continued development of technology supporting the STEP program, PDISE, and CPI2, as well as analysis and data management.</p> <p>FY 2019 Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP CPD. Specific efforts will include contract management and testing of hybrid/alternative energy power sources and power distribution/management system. Includes</p>	1.300	4.389	1.410	-	1.410

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army				Date: March 2019	
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>		Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>	
B. Accomplishments/Planned Programs (\$ in Millions)					
oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities. Includes \$3.0M Congressional add in support of tactical nuclear electric power program research for remote and forward operating bases.					
FY 2020 Base Plans: Support partnering efforts of power stakeholders including other services and other Army program offices. Provide support to Army demonstrations and exercises to evaluate power technologies under development and to gather Soldier feedback. System technologies will include hybrid technologies within small and medium power and operational use of microgrids.					
FY 2019 to FY 2020 Increase/Decrease Statement: FY20 is lower than FY19 due to one year congressional add in FY19.					
Title: Government Program Management					
Description: Continue development of technology supporting the STEP program, PDISE and CPI2.					
FY 2019 Plans: Oversight and management of various technology projects related to Tactical Electric Power and power distribution/management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the CPI2 Capabilities Development Document (CDD). Specific efforts will include support of CPI2, and power MDC systems. Oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities.					
FY 2020 Base Plans: Continue oversight and management of various technology projects related to Tactical Electric Power and power distribution/management across the DoD power spectrum. Specific efforts will include support of CPI2, missile defense systems, and other Army power consumers. Additional efforts include communicating power-related capability gaps and associated solutions across DoD and to OSD energy offices.					
FY 2019 to FY 2020 Increase/Decrease Statement: FY19 included additional management support due to ramped up support for the CPI2 program compared to FY20.					
Title: FY 2019 SBIR/ STTR Transfer					
FY 2019 Plans:					
	1.300	1.635	0.260	-	0.260
	-	0.107	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army	Date: March 2019
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 SBIR/STTR Transfer					
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> FY 2019 SIBR/STTR transfer .					
Accomplishments/Planned Programs Subtotals	4.982	6.331	3.338	-	3.338

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
• 194: <i>Engine Driven Gen Ed</i>	6.513	1.801	8.395	-	8.395	15.485	14.475	14.163	7.810	0.000	68.642
• MA9800: <i>Generators And Associated Equip</i>	115.704	134.341	58.566	2.436	61.002	62.126	75.155	73.228	76.022	0.000	597.578

Remarks

D. Acquisition Strategy
Complete advanced development pre-Milestone B technology assessments and analysis, and transition products to Engineering and Manufacturing Development (EMD) phase (Milestone B) and subsequent transition to production (Milestone C). Support concept development and demonstration efforts. Products and technologies supported include tactical power and energy sources, alternative/renewable energy systems, power distribution components, and power management and distribution control systems. Perform analysis of Operational Energy related impacts to future development programs to better direct RDECOM efforts.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>
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Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platoon Power Generation	MIPR	PM E2S2 : Ft. Belvoir, VA	-	0.100		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	MIPR	PM E2S2 : Fort Belvoir, VA	0.733	0.082		0.175		0.054		-		0.054	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	PM E2S2 : Ft. Belvoir, VA	0.596	0.096		0.250		0.091		-		0.091	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	PM E2S2 : Ft. Belvoir, VA	1.508	0.125		0.250		0.115		-		0.115	Continuing	Continuing	Continuing
Operational Energy	MIPR	PM E2S2 : Fort Belvoir, VA	1.528	0.132		0.150		-		-		-	Continuing	Continuing	Continuing
Subtotal			4.365	0.535		0.825		0.260		-		0.260	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Platoon Power Generation	MIPR	CERDEC : Fort Belvoir, VA	-	0.750		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	Various	CERDEC : Fort Belvoir, VA	3.281	0.750		0.300		0.104		-		0.104	Continuing	Continuing	Continuing
Hybrid Power Sources Components	Various	Multiple Vendors : TBD	2.370	0.305		0.200		0.183		-		0.183	Continuing	Continuing	Continuing
Power Management and Distribution Systems	Various	CERDEC : Fort Belvoir, VA	4.726	0.621		0.589		0.333		-		0.333	Continuing	Continuing	Continuing
Operational Energy	TBD	TBD : TBD (FY15)	2.409	0.500		0.249		-		-		-	Continuing	Continuing	Continuing
Metering and Monitoring Demo	Various	TBD : TBD	0.205	0.250		-		-		-		-	Continuing	Continuing	Continuing
FY 2019 SIBR/STTR Transfer	TBD	TBD : TBD	-	-		0.107		-		-		-	0.000	0.107	-
Subtotal			12.991	3.176		1.445		0.620		-		0.620	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) G11 / Adv Elec Energy Con Ad
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Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Small Tactical Electric Power (STEP) Components	MIPR	CERDEC : Fort Belvoir, VA	1.706	0.168		0.385		0.250		-		0.250	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	1.721	0.098		-		0.450		-		0.450	Continuing	Continuing	Continuing
Power Management and Distribution Control Systems	MIPR	CERDEC : Fort Belvoir, VA	1.750	0.110		0.376		0.710		-		0.710	Continuing	Continuing	Continuing
Platoon Power Generation	MIPR	CERDEC : Fort Belvoir, VA	-	0.101		-		-		-		-	Continuing	Continuing	Continuing
Modular Power	MIPR	Idaho National Labs; Air Force Civil Engineer Center : xxxx	-	-		3.000		-		-		-	Continuing	Continuing	Continuing
Operational Energy	MIPR	Dept of Energy Sandia National Labs : Washington DC	1.663	0.094		0.100		-		-		-	Continuing	Continuing	Continuing
Subtotal			6.840	0.571		3.861		1.410		-		1.410	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platoon Power Generation (PPG)	MIPR	CERDEC : Fort Belvoir, VA	-	0.250		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	MIPR	CERDEC : Fort Belvoir, VA	1.130	0.200		0.200		0.453		-		0.453	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	0.829	-		-		0.595		-		0.595	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	CERDEC : Fort Belvoir, VA	1.761	0.250		-		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

Event Name	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
SMALL TACTICAL ELECTRIC POWER (STEP) PROGRAM																												
Assess Technologies, such as STEP, to Meet Gaps-STEP																												
Develop prototypes for modular, scalable STEP systems																												
Transfer to Engineering and Manufacturing Development-STEP																												
AMMPS Hybrid Power Integration																												
AMMPS Hybrid Technology Assessment																												
AMMPS Hybrid Prototype Development																												
AMMPS Hybrid Prototype Test and Evaluation																												
AMMPS Hybrid Transfer to AMMPS POR																												
PDISE Expansion																												
Test Technologies (Intelligent distro. controls) to Meet Gaps-PDISE Expansion																												
Develop and Test Ruggedized PDISE Expansion prototypes with AMMPS Microgrid																												
Transfer to Engineering and Manufacturing Development-PDISE Expansion																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

Event Name	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
ASSESSMENT OF TECHNOLOGIES Across TEP line																												
Assess Technologies (remote start adapter) to Meet Gaps and																												
OPERATIONAL ENERGY (OE)																												
Evaluation of OE-Related Impacts, Systems and Improvemen																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SMALL TACTICAL ELECTRIC POWER (STEP) PROGRAM	1	2016	2	2021
Assess Technologies, such as STEP, to Meet Gaps-STEP	1	2016	2	2020
Develop prototypes for modular, scalable STEP systems	2	2020	2	2021
Transfer to Engineering and Manufacturing Development-STEP	2	2021	2	2021
AMMPS Hybrid Power Integration	1	2020	3	2022
AMMPS Hybrid Technology Assessment	1	2020	4	2020
AMMPS Hybrid Prototype Development	3	2019	3	2021
AMMPS Hybrid Prototype Test and Evaluation	3	2021	3	2022
AMMPS Hybrid Transfer to AMMPS POR	3	2022	4	2022
PDISE Expansion	1	2017	2	2023
Test Technologies (Intelligent distro. controls) to Meet Gaps-PDISE Expansion	1	2019	2	2020
Develop and Test Ruggedized PDISE Expansion prototypes with AMMPS Microgrid	1	2021	1	2023
Transfer to Engineering and Manufacturing Development-PDISE Expansion	2	2023	2	2023
ASSESSMENT OF TECHNOLOGIES Across TEP line	1	2017	4	2024
Assess Technologies (remote start adapter) to Meet Gaps and Improve Efficiencies	1	2017	4	2024
OPERATIONAL ENERGY (OE)	1	2016	4	2019
Evaluation of OE-Related Impacts, Systems and Improvements	1	2016	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>			
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
K39: <i>Field Sustainment Support Ad</i>	-	2.332	2.308	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.640
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project K39 completes in FY19

A. Mission Description and Budget Item Justification

This Project supports development of critical cargo aerial delivery capabilities. These systems will fill identified theater distribution and services capability gaps, improve unit sustainability, and increase combat effectiveness. This Project supports Advanced Component Development and Prototyping of Critical Distribution Capabilities which provide improved safety and accuracy while increasing survivability of aircraft, personnel, and equipment. This Project develops critical enablers that support the Army in executing future movement and maneuver operations and distributed sustainment support by maintaining readiness through fielding and integrating new equipment. This Project also ensures Army Expeditionary Forces are capable of rapid deployment through aerial delivery initiatives and reduces sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands in lift, combat zone footprint, and costs for logistical support.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Rapid Rigging and DeRigging Airdrop System (RRDAS) Phase I	1.821	1.277	-	-	-
Description: Effort to reduce rigging times while also providing the capability to rapidly de-rig loads on the drop zone. This will reduce the lead time to prepare Low Velocity Airdrop System (LVADS) loads while also increasing the survivability of receiving ground forces by ensuring the airdrop loads (to include weapon systems, prime movers, trailers, etc.) are quickly de-rigged and made operational. RRDAS is a three phase Research, Development, Testing and Engineering (RDT&E) effort, Phase I will focus on loads up to 20,000 pounds and platform lengths up to 20 feet and will include prime movers such as HMMWV.					
FY 2019 Plans: Complete component evaluation in realistic airdrop environment and transition to Engineering and Manufacturing Development (EMD).					
FY 2019 to FY 2020 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Army efforts complete in FY19 and thereafter funding reallocated to support the Army's modernization priorities in support of the National Defense Strategy.					
Title: Advanced Low Velocity Airdrop System (ALVADS) - Light and Heavy/ Dual Row Airdrop System (DRAS) Application Description: ALVADS provides the ability to drop equipment at 500 feet and can handle the extreme opening shocks associated with heavy equipment drops at low altitudes and the ability to quickly de-rig equipment on the battlefield. FY 2019 Plans: Conduct evaluation of established ALVADS DRAS configuration in a realistic operational environment. Conduct Milestone C. FY 2019 to FY 2020 Increase/Decrease Statement: Army efforts complete in FY19 and thereafter funding reallocated to support the Army's modernization priorities in support of the National Defense Strategy.	0.511	0.957	-	-	-
Title: SBIR/STTR FY 2019 Plans: SBIR/STTR FY 2019 to FY 2020 Increase/Decrease Statement: SBIR/STTR	-	0.074	-	-	-
Accomplishments/Planned Programs Subtotals	2.332	2.308	-	-	-

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
• MA7806: <i>Precision Airdrop</i>	4.147	5.731	0.000	2.040	2.040	2.040	-	-	-	0.000	13.958
• L39: <i>Field Sustainment Support Ed</i>	4.750	2.220	1.675	-	1.675	1.720	1.773	1.807	1.800	0.000	15.745

Remarks

D. Acquisition Strategy
 Conduct pre-Engineering and Manufacturing Development (EMD) advanced component development to reduce risk prior to entering EMD phase.

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

<u>E. Performance Metrics</u> N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				K39 / Field Sustainment Support Ad							
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support	Various	PMFSS : Natick, MA	6.610	0.400		0.202		-		-		-	0.000	7.212	-
SBIR+STTR	TBD	Various : Various	0.090	-		0.074		-		-		-	0.000	0.164	-
Subtotal			6.700	0.400		0.276		-		-		-	0.000	7.376	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Extracted High and Low Speed Container Delivery System (EHLSCDS)	Various	Various : Various	1.861	-		-		-		-		-	0.000	1.861	-
ALVADS-L/H DRAS	Various	Various : Various	0.500	0.437		-		-		-		-	0.000	0.937	-
JPADS Block 1 upgrade	Various	Various : Various	16.434	-		-		-		-		-	0.000	16.434	-
Rapid Rigging/Derigging	Various	Various : Various	-	0.495		0.250		-		-		-	0.000	0.745	-
Advanced Low Velocity Airdrop System-L/H	Various	Various : Various	1.300	-		0.295		-		-		-	0.000	1.595	-
Subtotal			20.095	0.932		0.545		-		-		-	0.000	21.572	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JPADS Block 1 upgrade	Various	Various : Various	0.110	-		-		-		-		-	0.000	0.110	-
ALVADS-L/H DRAS	Various	Various : Various	0.050	0.250		-		-		-		-	0.000	0.300	-
Rapid Riggind/DeRigging	Various	Various : Various	-	0.200		-		-		-		-	0.000	0.200	-
Subtotal			0.160	0.450		-		-		-		-	0.000	0.610	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

Event Name	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
Conduct RRDAS Phase I market research and acquire prototype comp																												
Conduct RRDAS Phase I component development/integration																												
Conduct RRDAS prototype design, fabrication, and demonstration																												
Conduct ALVADS/DRAS feasibility study																												
Conduct ALVADS/DRAS baseline evaluations																												
Conduct ALVADS/DRAS prototype flight tests																												
Evalaute Integrated RRDAS technology																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Conduct EHLSCDS validation testing	1	2016	1	2016
Conduct RRDAS Phase I market research and acquire prototype components	2	2018	3	2018
Conduct RRDAS Phase I component development/integration	3	2018	4	2018
JPADS Block I upgrade component development and risk reduction	1	2017	4	2017
Conduct RRDAS prototype design, fabrication, and demonstration	3	2019	4	2019
Conduct ALVADS/DRAS feasibility study	3	2017	1	2019
Conduct ALVADS/DRAS baseline evaluations	2	2018	3	2018
Conduct ALVADS/DRAS prototype flight tests	3	2018	4	2019
Evalaute Integrated RRDAS technology	1	2019	2	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>			
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
K41: <i>Water And Petroleum Distribution - Ad</i>	-	3.954	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.954
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project funding ends after FY 2018 to support the Army's modernization priorities in support of the National Defense Strategy.

A. Mission Description and Budget Item Justification

This Project develops and demonstrates the potential of prototype equipment and technologies to satisfy petroleum storage, distribution, and quality surveillance system requirements. The Technology Development programs support the development and enhancement of rapidly deployable Petroleum and Water equipment. The mission includes developing fuel quality analysis systems; achieving greater capabilities in the removal of Nuclear, Biological, Chemical (NBC) and other contaminants from water sources; reducing the logistics footprint; alternative source water acquisition, reutilization and disposal systems to reduce the requirement for transport of water into the theater; water purification and waste water treatment and material systems to decrease the logistics footprint and employment time for the transfer of liquid logistics in joint operations area. This vital equipment enables the Army to achieve its mission by providing the the means to be highly mobile and self-sustaining in very hostile joint operations areas. Future Force operations demand that combat systems be rapidly deployable to the theater, rapidly emplaced upon arrival, and rapidly relocated to support a fast moving non-linear battlefield.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: 3K Tactical Water Purification System (3K TWPS)	0.969	-	-	-	-
Description: The 3,000 (3k) Gallons per Hour (GPH) Tactical Water Purification System (TWPS) replaces the legacy 3,000 (3k) GPH Reverse Osmosis Water Purification Unit (ROWPU), which is currently the largest water purification capability in the Army's inventory and is nearing the end of its useful life. The 3k TWPS shall be the sole bulk water capability supporting Echelons Above Brigade (EAB) and will be the primary water purification capability for laundry and shower facilities. Purifies up to 3,000 GPH from any water source, including 60,000 mg/L Total Dissolved Solids (TDS) salt water and CBRN contaminated sources. Consists of feed water pumps, hoses, media and cartridge filters, high pressure pump, reverse osmosis elements, 3,000 gallon water storage and distribution system and control panel. Supports all tactical water missions LH S/PLS compatible via C HU/ E-CHU.					
Title: Early Entry Fluid Distribution System (E2FDS)	2.985	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: The Early Entry Fluid Distribution System (E2FDS) is a rapidly emplaced, high-throughput petroleum distribution conduit system. The E2FDS consists of 5-mile systems that can be connected to each other to form a pipeline trace up to 50 miles long. It can throughput 850,000 gallons of petroleum or 650,000 gallons of raw/non-potable water per day. E2FDS is emplacement at a rate of 25 miles per day and retrieved at a rate of 10 miles per day. The components are configured in stackable International Standards Organization (ISO) 20-foot equivalent units (TEU) for deployment and is Heavy Expanded Mobility Tactical Truck-Load Handling System (HEMTT-LHS), Palletized Load System (PLS) and PLS Trailer transportable. It includes a Command and Control Module (C2M) that allows for central control of the pipeline trace from a single location. The E2FDS complements the Inland Petroleum Distribution System (IPDS) by adding an early entry capability as well as a means for rapidly extending existing pipeline.					
Accomplishments/Planned Programs Subtotals	3.954	-	-	-	-

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>			<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• L41: <i>Water And Petroleum Distribution - Ed</i>	6.127	10.761	7.540	-	7.540	7.559	7.620	7.935	5.685	0.000	53.227
• MA6000: <i>Distribution Systems, Petroleum & Water</i>	41.622	26.471	74.867	13.986	88.853	76.583	54.169	27.142	37.552	0.000	352.392
• R67500: <i>PETROLEUM QUALITY ANALYSIS SYSTEM</i>	6.903	-	0.000	-	0.000	-	-	-	-	0.000	6.903

Remarks

D. Acquisition Strategy

Develop engineering prototypes for the 3K Tactical Water Purification System (3K TWPS), Army Fuels Automated Management System (AFAMS), and select Non-Development Item (NDI) based on market surveys and proposals from industry. Based on market research findings, award a competitive or sole source contract. Early Entry Fluid Distribution System (E2FDS) will conduct Developmental Testing (DT) and will test data to inform a fair opportunity decision for production. Army Fuels Automated Management System (AFAMS) sensors will require the development and testing of self-reporting sensors for all fuel storage tanks.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				K41 / Water And Petroleum Distribution - Ad							
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
3K Tactical Water Purification System (3K TWPS)	Various	TARDEC : Warren, MI	1.030	0.969		-		-		-		-	0.000	1.999	Continuing
Early Entry Fluid Distribution System (E2FDS)	C/FFP	DRS : West Plains, IL	5.888	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			6.918	0.969		-		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Early Entry Fluid Distribution System (E2FDS)	MIPR	TARDEC & PM, PAWS : Warren, MI	3.147	-		-		-		-		-	0.000	3.147	Continuing
3K TWPS	MIPR	TARDEC : Warren, MI	0.273	-		-		-		-		-	0.000	0.273	-
Subtotal			3.420	-		-		-		-		-	0.000	3.420	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Modular Fuel System (MFS)	MIPR	Yuma Proving Ground : Yuma, AZ	0.750	-		-		-		-		-	0.000	0.750	Continuing
3K Tactical Water Purification System (3K TWPS)	MIPR	TARDEC : Warren, MI	1.312	-		-		-		-		-	0.000	1.312	Continuing
Early Entry Fluid Distribution System (E2FDS)	MIPR	Aberdeen Proving Ground : APG, MD	-	2.985		-		-		-		-	0.000	2.985	-
Subtotal			2.062	2.985		-		-		-		-	0.000	5.047	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army							Date: March 2019				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>				

	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	12.400	3.954	0.000	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>

Event Name	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	
3K Tactical Water Purification System (3K TWPS)																													
3K TWPS Milestone B	▲ 1 MS B																												
3K TWPS Preliminary Design Review					▲ 5 PDR																								
3K TWPS CDR									▲ 9 CDR																				
3K TWPS Developmental Testing									■																				
3K TWPS Milestone C													▲ 10 MS C																
3K TWPS Production Qualification Testing / Operational Testing													■																
Black Water Treatment (BWT)																													
Black Water Treatment Materiel Development Decision			▲ 3 MDD																										
Black Water Treatment Milestone B									▲ 6 MS B																				
Black Water Treatment Preliminary Design Review									▲ 7 PDR																				
Black Water Treatment Critical Design Review													▲ 11 CDR																
Black Water Treatment Development Testing													■																

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>

Event Name	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				
Early Entry Fluid Distribution System (E2FDS)																																
E2FDS Preliminary Design Review (PDR)		▲ 2 PDR																														
E2FDS Critical Design Review (CDR)				▲ 4 CDR																												
E2FDS Developmental Testing					DT																											
E2FDS Milestone C																																
E2FDS First Article Test / Initial Operational Testing													FAT/IOT																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
3K Tactical Water Purification System (3K TWPS)	4	2016	2	2022
3K TWPS Milestone B	2	2018	2	2018
3K TWPS Preliminary Design Review	1	2019	1	2019
3K TWPS CDR	1	2020	1	2020
3K TWPS Developmental Testing	3	2019	4	2019
3K TWPS Milestone C	3	2020	3	2020
3K TWPS Production Qualification Testing / Operational Testing	3	2021	3	2022
Black Water Treatment (BWT)	1	2019	1	2019
Black Water Treatment Materiel Development Decision	4	2018	4	2018
Black Water Treatment Milestone B	3	2019	3	2019
Black Water Treatment Preliminary Design Review	4	2019	4	2019
Black Water Treatment Critical Design Review	1	2022	1	2022
Black Water Treatment Development Testing	2	2021	4	2021
Early Entry Fluid Distribution System (E2FDS)	1	2017	4	2020
E2FDS Preliminary Design Review (PDR)	2	2018	2	2018
E2FDS Critical Design Review (CDR)	4	2018	4	2018
E2FDS Developmental Testing	1	2019	3	2019
E2FDS Milestone C	4	2019	4	2019
E2FDS First Article Test / Initial Operational Testing	1	2021	3	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>			
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
VR8: <i>Combat Service Support Systems - Ad</i>	-	3.334	3.218	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.552
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project VR8 completes in FY19

A. Mission Description and Budget Item Justification

This Project supports Advanced Component Development and Prototyping of critical soldier support and sustainment systems that provide more endurance and agility to combat operations enabling success of Army Expeditionary Forces in future multi-domain scenarios. Project includes shelter systems (rigid and soft wall), expeditionary base camp subsystems, field service systems, mortuary affairs equipment, field heaters, and other combat service support equipment. These systems will fill identified theater capability gaps, improve unit sustainability, improve resource and energy efficiency and increase combat effectiveness. This Project supports Advanced Component Development and Prototyping of critical tactical support systems that support mobile Joint Service command and control, medical, and maintenance platforms. This Project develops critical enablers that support the Army Campaign Plan and Army Modernization Strategy by maintaining readiness through fielding and integrating new equipment.

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

	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Resource and Energy Efficiency Enabling Solutions	0.964	1.409	-	-	-
Description: Reduces the resource, operational energy and logistics footprint of critical soldier support and sustainment systems while maintaining or improving operational effectiveness. The goal is to significantly reduce fuel, water, and power requirements to sustain multi-domain operations in addition to reducing maintenance and spare parts requirements. Systems such as Command Posts, Expeditionary Operating Bases, and Combat Support Hospitals require a significant amount of logistics and sustainment support which cost valuable resources, require extra human effort (that means a risk in the form of Soldiers on the road), limit endurance, restrict agility, and increase vulnerability.					
FY 2019 Plans: Conduct evaluation of integrated technologies that are transitioning from RDECOM 6.3 programs in a realistic operational environment utilizing the Base Camp Integration Laboratory (BCIL). Focus efforts on technologies that will make the greatest impact on reducing resource and operational energy demands of current and developing critical enabling soldier support and sustainment platforms that support multi-domain operations to include integrated Command Posts and expeditionary sustainment systems. Identify promising alternative					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
energy sources, renewable energy collection and storage capabilities for integration and conduct evaluations. Collect data from evaluations to inform and support Decision Points for transition into EMD. FY 2019 to FY 2020 Increase/Decrease Statement: Army efforts complete in FY19 and funding thereafter reallocated to support the Army's modernization priorities in support of the National Defense Strategy.					
Title: Black Waste Elimination for Small Base Camps (150 personnel) Description: Provides the capability to reduce/eliminate the black water generated by small base camps. The objective capability will reduce our sustainment requirements for backhauling black waste water as well as our risk of contaminating the environment with biological contaminants. This capability will significantly reduce reliance on external support and is a key capability required to reduce sustainment requirements.	0.670	-	-	-	-
Title: Expeditionary Waste to Energy System Description: The Expeditionary Waste to Energy System reduces the operational energy and logistics footprint of the expeditionary base camp system with the goal of providing an integrated waste management and disposal process add-on capability that can safely process up to two tons of mixed solid organic waste in a single day on site with the energy associated with the management process being converted to usable energy in the form of fuel, heat and/or electric power. This capability will provide a safe and suitable means to dispose of waste in remote expeditionary base camps while reducing the fuel and power requirements to sustain operations in the field. This capability provides a substantial improvement over the current practice of burn pits and backhaul with associated vulnerabilities and safety issues.	0.200	-	-	-	-
Title: Army Standard Family of Soft Wall Shelters (ASF-SWS) Description: The ASF-SWS program will conduct formal development to incorporate the latest technologies into a fully supportable and modernized family. The intent is to eliminate the proliferation of non-standard shelters and their associated logistics burden, thereby reducing the lifecycle cost of SWS across the Services. The program will produce approved Technical Data Packages (TDPs) to support procurements by materiel developers and Program Managers (PMs) requiring SWS. ASF-SWS procurements are customer funded by PMs as a cost under their program(s). FY 2019 Plans:	-	0.891	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army				Date: March 2019	
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>		Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>		
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
No FY 2019 Plans as ASF-SWS program is not being funded in FY19. FY 2019 to FY 2020 Increase/Decrease Statement: Army efforts complete in FY19 and funding thereafter reallocated to support the Army's modernization priorities in support of the National Defense Strategy.					
Title: Army Standard Family of Rigid Wall Shelters (ASF-RWS) Description: The ASF-RWS program will conduct formal development to incorporate the latest technologies into a fully supportable and modernized family. The intent is to eliminate the proliferation of non-standard shelters and their associated logistics burden, thereby reducing the lifecycle cost of RWS across the Services. The program will produce approved Technical Data Packages (TDPs) to support procurements by materiel developers and Program Managers (PMs) requiring RWS. ASF-RWS procurements are customer funded by PMs as a cost under their program(s). The ASF-RWS will consist of three variants: (1) Expandable/Non-Expandable; (2) Vehicle Mounted; and (3) Panelized/Collapsible with a focus on the following features and improvements: reduced cost, reduced weight, improved energy efficiency, improved corrosion resistance, and improved transportability. FY 2019 Plans: Award OTA Project for Expandable/Non-Expandable ASF-RWS Variant development. Conduct design, development, and prototype test items build for Expandable/Non-Expandable shelter variant. Initiate development of Technical Data Package (TDP) for Expandable/Non-Expandable shelter variant FY 2019 to FY 2020 Increase/Decrease Statement: Army efforts complete in FY19 and funding thereafter reallocated to support the Army's modernization priorities in support of the National Defense Strategy.	1.500	0.815	-	-	-
Title: SBIR/STTR FY 2019 Plans: SBIR/STTR FY 2019 to FY 2020 Increase/Decrease Statement: SBIR/STTR	-	0.103	-	-	-
Accomplishments/Planned Programs Subtotals	3.334	3.218	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• VR7: <i>Combat Service Support Systems</i>	3.594	4.527	0.000	-	0.000	-	-	-	-	0.000	8.121

Remarks

D. Acquisition Strategy

Evaluate integrated technologies in a realistic operational environment and transition promising efforts into Engineering and Manufacturing Development (EMD). Accelerate efficiency, standardization, and safety initiatives to incorporate in deployed systems, develop new Technical Data Packages (TDP), and/or incorporate during reset of equipment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				VR8 / Combat Service Support Systems - Ad							
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support	Various	PM FSS : Natick, MA	1.847	0.429		0.365	Nov 2018	-		-		-	0.000	2.641	-
SBIR+STTR	TBD	various : Various	0.062	-		0.103		-		-		-	0.000	0.165	-
Subtotal			1.909	0.429		0.468		-		-		-	0.000	2.806	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Soldier Support Equipment	Various	Various : Various	8.057	2.050		-		-		-		-	0.000	10.107	-
Energy Efficiency Enabling Solutions	Various	Various : Various	0.191	-		0.681	Jan 2019	-		-		-	0.000	0.872	-
Army Standard Family of Soft Wall Shelters (ASF-SWS)	Various	Various : Various	-	-		0.746	Mar 2019	-		-		-	0.000	0.746	-
Army Standard Family of Rigid Wall Shelters (ASF-RWS)	Various	Various : Various	-	-		0.295	Dec 2018	-		-		-	0.000	0.295	-
Subtotal			8.248	2.050		1.722		-		-		-	0.000	12.020	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Soldier Support Equipment	Various	Various : Various	4.795	0.855		-		-		-		-	0.000	5.650	-
Energy Efficiency Enabling Solutions	Various	Various : Various	0.715	-		0.478	Feb 2019	-		-		-	0.000	1.193	-
Army Standard Family of Soft Wall Shelters (ASF-SWS)	Various	Various : Various	-	-		0.100	Mar 2019	-		-		-	0.000	0.100	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

Event Name	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
Conduct evaluation on resource & energy efficiency enabling sc	█				█																							
Conduct evaluation and demonstration of Black Waste Eliminati	█				█																							
Conduct technology assessment on Waste to Energy capabilitie	█				█																							
Evaluate integrated ASF-RWS technologies for all variants	█				█																							
Prepare for and conduct ASF-RWS Materiel Development Decis (D)	█				█																							
Prepare for Milestone B and transition ASF-RWS (Exp/Non-Exp) to EMD	█				█																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Conduct evaluation on resource & energy efficiency enabling solutions	1	2016	4	2019
Conduct evaluation and demonstration of Black Waste Elimination technologies	1	2016	4	2018
Complete and transition ESPS to EMD development	1	2015	3	2015
Evaluate Solid waste Disposal Technologies for small base camps	1	2017	4	2017
Conduct demonstration of ULCANS technology enhancements	1	2016	4	2017
Conduct technology assessment on Waste to Energy capabilities	1	2016	4	2018
Evaluate integrated ASF-RWS technologies for all variants	1	2016	4	2019
Prepare for and conduct ASF-RWS Materiel Development Decision (MDD)	3	2017	1	2018
Prepare for Milestone B and transition ASF-RWS (Exp/Non-Exp) to EMD	1	2019	2	2019