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**Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	15.287	11.055	9.638	-	9.638	7.764	12.728	2.840	2.868	Continuing	Continuing
526: Marine Orien Log Eq Ad	-	0.809	2.493	2.475	-	2.475	2.485	2.477	2.840	2.868	Continuing	Continuing
EW8: Armored Engineer Vehicles	-	5.478	4.562	7.163	-	7.163	5.279	10.251	-	-	0.000	32.733
G11: Adv Elec Energy Con Ad	-	9.000	4.000	-	-	-	-	-	-	-	0.000	13.000

**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, armored engineer vehicles to include development of a robotic capability Remote Control System for the Assault Breacher Vehicle, 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, bulk fuel, water generation, regulatory compliance and reliability of existing systems.

**B. Program Change Summary (\$ in Millions)**

	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023 Base</u>	<u>FY 2023 OCO</u>	<u>FY 2023 Total</u>
Previous President's Budget	8.587	7.055	0.000	-	0.000
Current President's Budget	15.287	11.055	9.638	-	9.638
Total Adjustments	6.700	4.000	9.638	-	9.638
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.700	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	9.638	-	9.638

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** G11: Adv Elec Energy Con Ad

Congressional Add: Contract Activity

Congressional Add: Maneuverable Lightweight Electric Weight Reducer (MLEWR)

	FY 2021	FY 2022
Congressional Add: Contract Activity	4.000	4.000
Congressional Add: Maneuverable Lightweight Electric Weight Reducer (MLEWR)	5.000	-

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>
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**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

	FY 2021	FY 2022
Congressional Add Subtotals for Project: G11	9.000	4.000
Congressional Add Totals for all Projects	9.000	4.000

**Change Summary Explanation**

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2023 Army **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> 526 / Marine Orien Log Eq Ad
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
526: Marine Orien Log Eq Ad	-	0.809	2.493	2.475	-	2.475	2.485	2.477	2.840	2.868	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project line supports the family of Army Ship to Shore (S2S) connectors that support Dynamic Force Repositioning (DFR) by providing the Combatant, Multi-Domain Operations (MDO) and Joint All Domain Operations (JADO) Commanders with the ability to access multiple entry points via littorals and inland waterways (waterborne corridor) IOT sustain forces within an anti-access/area denial (A2/AD) bubble. The family of S2S connectors include the Maneuver Support Vessel (Light) and the Ship to Shore / Over the Shore Logistics Vessel (SSLV), which are the Army's first digital architecture vessels (with improved draft, speed, and payload) and critical modernization efforts in support of the Army's Watercraft Systems Transformation Strategy (AWSTS). S2S connectors will provide Surge, Precision and Dispersed Logistics to move and maneuver tailored forces, combat ready troops, platforms, equipment, and supply bulk fuel and water across the full spectrum of operations. S2S connectors mitigate A2/AD threats by providing access to shallow coastal waters, rivers, in narrow inland waterways in support of dispersed force elements in austere environments and where mature ports or road networks are unavailable.

In general, all Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, and survivability while increasing the lethality, tactical mobility, and operational capability of the Army Mariner to preserve the Combatant Commanders requirement of "freedom of seas" access in all areas of the world particularly the littorals, to support maneuver operations in all Areas of Responsibility. All modification and services efforts are critical enablers for the success Army's Watercraft Systems Transformation Strategy (AWSTS) and continued fulfillment of the AWS Title 10 mission.

In addition, funded efforts will address critical gaps in these areas for the legacy fleet, while at the same time researching, developing and testing emergent technologies. To support future acquisitions and future fleet planning, funding efforts 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.

FY 2023 RDTE dollars in the amount of \$2.475 million supports modernization of the legacy fleet by investigating technology insertions, including, but not limited to: force protection, prognostics & preventative maintenance, vessel electronics, 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 2021	FY 2022	FY 2023
<b>Title:</b> Environmental Compliance Projects	0.062	0.045	0.060
<b>Description:</b> Environmental projects enable compliance with requirements as defined under in the law Uniform National Discharge Standards (UNDS) and Environmental Protection Agency (EPA) emissions standards. The EPA reviews the UNDS			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army		<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> 526 / <i>Marine Oriented Log Eq Ad</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
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.				
<b>FY 2022 Plans:</b> Batch Three, Phase III - Army UNDS Implementation documentation update				
<b>FY 2023 Plans:</b> Batch Three, Phase III - Army UNDS Implementation (training documentation)				
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY 2023 increase is due to support needed to development of Acquisition, Training, Operation, and Maintenance Documentation as well as develop an Army Ballast Water Exchange Guidance Document.				
<b>Title:</b> Force Protection Capability		0.447	1.597	1.973
<b>Description:</b> 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) cameras.				
<b>FY 2022 Plans:</b> Provide support to complete design, prototype install, test, and final TDP for the CROWS aboard LCU watercraft fleet. The EoF capabilities could include, but are not limited to, white light, green dazzler, an acoustic hailing device, percussion grenades, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.				
<b>FY 2023 Plans:</b> Support to complete testing and final TDP for the CROWS aboard LCU watercraft fleet. The EoF capabilities could include, but are not limited to, white light, green dazzler, an acoustic hailing device, percussion grenades, sub surface surveillance, and Electro-Optical / Infrared (EO/IR) capabilities.				
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY 2023 increase is due to complete testing and efforts to investigate sub-surface surveillance for CROWS.				
<b>Title:</b> Army Watercraft Program Support		0.300	0.307	0.442
<b>Description:</b> 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.				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> 526 / Marine Orient Log Eq Ad

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<p><b>FY 2022 Plans:</b> Provide engineering support for C5ISR Studies and Force Protection design work.</p> <p><b>FY 2023 Plans:</b> Provide engineering support for C5ISR Studies and Force Protection design work.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY 2023 increase is due to test of CROWS aboard watercraft fleet.</p>			
<p><b>Title:</b> Trade Studies and Business Analyses</p> <p><b>Description:</b> Conduct Affordability and Feasibility Studies for concept development concept development for future vessel platforms.</p> <p><b>FY 2022 Plans:</b> Initiation of human factor engineer analysis and initiation of electrical power studies to support Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C5ISR) upgrades and joint operation capabilities for legacy vessels.</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The FY 2023 decrease is due to completion of trade studies.</p>	-	0.453	-
<p><b>Title:</b> SBIR/STTR Transfer</p> <p><b>Description:</b> Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2022 Plans:</b> Funding transferred in accordance with Title 15 USC ?638</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding transferred in accordance with Title 15 USC ?638</p>	-	0.091	-
<b>Accomplishments/Planned Programs Subtotals</b>	0.809	2.493	2.475

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• MA4501: MODIFICATION KITS	57.908	31.300	14.613	-	14.613	11.366	11.511	8.325	8.321	Continuing	Continuing

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> 526 / <i>Marine Oriented Log Eq Ad</i>

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

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	Total Cost
			Base	OCO	Total					Complete	
• MA4502: <i>INSTALLATION OF MODIFICATIONS</i>	6.969	5.574	6.957	-	6.957	5.948	8.510	5.807	5.805	Continuing	Continuing
• M11101: <i>Army Watercraft Esp</i>	44.660	58.009	47.889	-	47.889	30.809	30.818	30.892	30.877	0.000	273.954
• ML5355: <i>Items Less Than \$5.0M (Float/Rail)</i>	1.844	-	10.131	-	10.131	23.070	18.000	18.063	18.237	0.000	89.345

**Remarks**

FY 2021 Accomplishments:

- Completed government testing in support of Safety Confirmation and Transportability Certification for MCS SLEP
- Updated engineering drawings for the finalization of the TDP for MCS SLEP
- Initiated CROWS design for LCU 2000
- Developed draft Strategic Implementation Plan for Army Compliance with Uniform National Discharge Standards (UNDS)

**D. Acquisition Strategy**

Leverage government and public research centers Ground Vehicle Systems Center (GVSC), Naval Surface Warfare Center (NSWC) Philadelphia, AWS System Technical Support (STS) contractor (McKean Defense) 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.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> 526 / Marine Oriented Log Eq Ad
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
SBIR/STTR	TBD	Various : Various	-	-		0.091		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	-		0.091		-		-		-	Continuing	Continuing	N/A

<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	4.843	0.447	Nov 2020	1.597	Nov 2021	1.973	Nov 2022	-		1.973	Continuing	Continuing	-
At Sea Transfer Systems (Modular Warping Tug / Causeway Ferry)	SS/CPFF	TARDEC DTIC - I, Battelle : Fort Belvoir, VA	9.466	-		-		-		-		-	0.000	9.466	-
Environmental Compliance Uniform National Discharge Standards (UNDS)	MIPR	Carderock : Maryland and Pennsylvania	3.341	0.062	Nov 2020	0.045	Nov 2021	0.060	Oct 2022	-		0.060	Continuing	Continuing	-
Trade Study Analyses	TBD	TBD : TBD	-	-		0.453	Feb 2022	-		-		-	0.000	0.453	-
<b>Subtotal</b>			17.650	0.509		2.095		2.033		-		2.033	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 : Maryland, Warren, MI	2.347	0.300	Dec 2020	0.307	Dec 2021	0.442	Dec 2022	-		0.442	Continuing	Continuing	-
<b>Subtotal</b>			2.347	0.300		0.307		0.442		-		0.442	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2023 Army</b>								<b>Date: April 2022</b>			
<b>Appropriation/Budget Activity</b> 2040 / 4			<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev				<b>Project (Number/Name)</b> 526 / Marine Oriented Log Eq Ad				
	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>		<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>	19.997	0.809	2.493		2.475	-	2.475	Continuing	Continuing	N/A	

**Remarks**  
 COVID19: The COVID19 pandemic is driving significant cost increases across the shipbuilding industry (absenteeism, demand for skilled trades, safety protocols, and reliance on sub-contractor TDY). Although vaccinations could potentially mitigate some risks, the Army will continue to monitor the situation closely.

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Army</b>		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> 526 / <i>Marine Oriented Log Eq Ad</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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	[Redacted]																											
Force Protection: Common Remotely Operated Weapon Station	[Redacted]																											
Force Protection: CROWS on LSV Class	[Redacted]																											
Force Protection: CROWS on LCU Class	[Redacted]																											
At Sea Transfer Technology (MCS)	[Redacted]																											
Modular Warping Tug (MWT) / Causeway Ferry (CF)	[Redacted]																											
Environmental Compliance	[Redacted]																											
Uniformed National Discharge Standards (UNDS)	[Redacted]																											
UNDS Batch 3	[Redacted]																											
Trade Studies and Business Analyses	[Redacted]																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2023 Army</b>		<b>Date: April 2022</b>
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> 526 / <i>Marine Oriented Log Eq Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Army Watercraft Program Support	1	2018	4	2027
Force Protection: Common Remotely Operated Weapon Station (CROWS)	1	2018	4	2027
Force Protection: CROWS on LSV Class	1	2018	2	2022
Force Protection: CROWS on LCU Class	1	2018	4	2023
At Sea Transfer Technology (MCS)	1	2018	1	2021
Modular Warping Tug (MWT) / Causeway Ferry (CF)	1	2018	1	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	2020
Environmental Compliance	1	2018	4	2027
Uniformed National Discharge Standards (UNDS)	1	2018	4	2027
UNDS Batch 2	4	2020	4	2020
UNDS Batch 3	4	2022	4	2022
Trade Studies and Business Analyses	4	2019	2	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army										<b>Date:</b> April 2022		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				<b>Project (Number/Name)</b> EW8 / <i>Armored Engineer Vehicles</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EW8: <i>Armored Engineer Vehicles</i>	-	5.478	4.562	7.163	-	7.163	5.279	10.251	-	-	0.000	32.733
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project supports the prototype development, test and evaluation of a robotic capability Remote Control System (RCS) for the Assault Breacher Vehicle (ABV), to include prototype fabrication, developmental testing, operational testing and logistics demonstration / user test events.

Funding supports modernization of Army Bridging and Armored Engineer Vehicle 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.

FY 2023 Base dollars in the amount of \$7.163 million supports the Assault Breacher Vehicle Robotic Control System (ABV RCS) Prototype Development and Fabrication, start of prototype testing, shipping of Government Furnished Equipment (GFE), ABV refurb at Anniston Army Depot and manpower.

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

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>
<b>Title:</b> Assault Breacher Vehicle (ABV) Remote Control System (RCS)	5.478	4.395	7.163
<b>FY 2022 Plans:</b> Funding supports the development and fabrication of RCS prototypes, SEPM matrix functional support and SBIR/STTR transfer (\$166,510.00).			
<b>FY 2023 Plans:</b> Funding will complete development and fabrication of 4 ABV RCS prototypes and begin the refurbishment of an additional ABV RCS prototype system. Also will fund the start of prototype testing on completed assets and shipment of GFE equipment to and from the test location to support test.			
<b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Funding requirements increased in FY 2023 due to start of test and planned refurbishment of another ABV asset as well as completion of the 4 ABV RCS prototypes			
<b>Title:</b> ABV RCS SBIR/STTR transfer	-	0.167	-
<b>FY 2022 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> EW8 / <i>Armored Engineer Vehicles</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023
SBIR/STTR/ FFRDS transfer tax			
<b><i>FY 2022 to FY 2023 Increase/Decrease Statement:</i></b> SBIR/STTR/FFRDC transfer included in FY22.			
<b>Accomplishments/Planned Programs Subtotals</b>	5.478	4.562	7.163

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• G82925: <i>Assault Breacher Vehicle</i>	19.500	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing

**Remarks**

**D. Acquisition Strategy**

The Assault Breacher Vehicle (ABV) Remote Control System (RCS) program will pursue a competitive prototype development and testing strategy with multiple vendors to select an RCS materiel solution for production and integration into the ABV system. Anniston Army Depot (ANAD) is refurbishing 4 ABV assets to GFE two each to two (2) vendors. Prototypes will be developed and refined through one User Jury event in 2024. Competitive testing will be used to down-select to one design.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> EW8 / Armored Engineer Vehicles
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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			
ABV RCS Matrix Functional Support	MIPR	Various : Various	0.929	0.020	Apr 2022	0.921	Nov 2021	0.990	Nov 2022	-		0.990	0.000	2.860	-
ABV RCS SBIR/STTR transfer	TBD	TBD : TBD	-	-		0.167		-		-		-	0.000	0.167	-
<b>Subtotal</b>			0.929	0.020		1.088		0.990		-		0.990	0.000	3.027	N/A

<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	-		-		-		-		-	0.000	1.285	-
JAB Force Protection Development and Fabrication	SS/FFP	DRS SUSTAINMENT SYSTEMS, INC. : SAINT LOUIS, MO	2.084	-		-		-		-		-	0.000	2.084	-
ABV RCS Prototype Development and Fabrication	C/TBD	TBD : TBD	-	-		3.474	Apr 2022	2.770	Oct 2022	-		2.770	0.000	6.244	-
ABV RCS Refurbishment of ABV assets for testing	MIPR	Anniston Army Depot : Anniston AL	-	5.438	Sep 2021	-		2.753	Apr 2023	-		2.753	0.000	8.191	-
ABV RCS shipping	TBD	TBD : TBD	-	0.020	Apr 2022	-		0.150		-		0.150	0.000	0.170	-
<b>Subtotal</b>			3.369	5.458		3.474		5.673		-		5.673	0.000	17.974	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	5.214	-		-		-		-		-	0.000	5.214	-



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Army</b>			<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> EW8 / Armored Engineer Vehicles	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
ABV RCS P Spec Development	[Redacted]				[Redacted]																							
ABV RCS Request for Prototype Proposals					▲ 1 ABV RCS RPP																							
ABV Overhaul (Qty of 2)					[Redacted] ABV Overhaul ANAD																							
ABV RCS Overhaul/ Refurb cont. (Qty of 1)									[Redacted] Additional ABV Refurb ANAD																			
ABV RCS Prototype Source Selection					[Redacted] ABV RCS Source Selection																							
ABV RCS Prototype OTA Awards 2 vendors					▲ 2 ABV RCS OTA Awards (2 vendors)																							
ABV RCS Prototype Development									[Redacted] ABV RCS Prototype Development																			
ABV RCS User Jury													▲ 3 ABV RCS User Jury															
ABV RCS Logistics Development									[Redacted] ABV RCS Logistics Development																			
ABV RCS Prototype Test													[Redacted] ABV RCS Prototype Test															
ABV RCS Developmental Test / Operational Test																	[Redacted] ABV RCS DT/OT/LFT&E											
ABV RCS Request For Proposals																	▲ 4 ABV RCS RFP											
ABV RCS Contract Award																					▲ 5 ABV RCS Award							



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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2023 Army</b>		<b>Date: April 2022</b>
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> EW8 / <i>Armored Engineer Vehicles</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ABV RCS P Spec Development	1	2020	4	2021
ABV RCS Request for Prototype Proposals	1	2022	1	2022
ABV Overhaul (Qty of 2)	4	2021	2	2022
ABV RCS Overhaul/ Refurb cont. (Qty of 1)	4	2023	4	2023
ABV RCS Prototype Source Selection	2	2022	2	2022
ABV RCS Prototype OTA Awards 2 vendors	3	2022	3	2022
ABV RCS Prototype Development	3	2022	4	2023
ABV RCS User Jury	1	2024	1	2024
ABV RCS Logistics Development	4	2022	3	2023
ABV RCS Prototype Test	4	2023	2	2024
ABV RCS Developmental Test / Operational Test	1	2025	4	2025
ABV RCS Request For Proposals	3	2024	3	2024
ABV RCS Contract Award	1	2025	1	2025
ABV RCS Provisioning	1	2025	2	2028
ABV RCS Test Asset build	1	2025	4	2025
ABV RCS Early User Test	4	2025	1	2027
ABV RCS LRIP DO award	1	2027	1	2027
ABV RCS Production	2	2027	1	2029
ABV RCS Fieldings	2	2027	1	2029

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**Exhibit R-2A, RDT&E Project Justification:** PB 2023 Army **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> G11 / <i>Adv Elec Energy Con Ad</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
G11: <i>Adv Elec Energy Con Ad</i>	-	9.000	4.000	-	-	-	-	-	-	-	0.000	13.000
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 with technology insertions including, but not limited to hybrid capabilities, light-weight power solutions, vehicle/tactical microgrid interoperability and Tactical Microgrid Standards (TMS). Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment an operational energy concepts.

Funding supports the Maneuverable Lightweight Electric Weight Reducer (MLEWR) Assessment. This portfolio supports an innovative soldier load reducing system to include an all-terrain, tactically silent electric cart which has zero emissions. This system can carry twice its own weight over long distances and difficult terrain, including when climbing stairs and submerged in water. This analysis will inform an Army Buy-Try-Decide process.

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

	FY 2021	FY 2022
<b>Congressional Add:</b> Contract Activity	4.000	4.000
<b>FY 2021 Accomplishments:</b> Execution of FY21 congressional funding to develop lightweight, portable power generation.		
<b>FY 2022 Plans:</b> FY22 congressional funds to be executed on the continued development of lightweight, portable power generation.		
<b>Congressional Add:</b> Maneuverable Lightweight Electric Weight Reducer (MLEWR)	5.000	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2023 Army	<b>Date:</b> April 2022
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> G11 / <i>Adv Elec Energy Con Ad</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>
<i><b>FY 2021 Accomplishments:</b></i> Execution of FY21 congressional funding to develop and integrate a soldier load reducing system.		
<b>Congressional Adds Subtotals</b>	9.000	4.000

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 194: <i>Engine Driven Gen Ed</i>	4.726	16.317	15.023	-	15.023	13.077	12.393	7.304	7.374	0.000	76.214
• MA9800: <i>Generators And Associated Equip</i>	101.239	105.892	54.400	-	54.400	80.713	87.635	96.284	96.257	Continuing	Continuing

**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 United States Army Combat Capabilities Development Command (CCDC) efforts.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> G11 / Adv Elec Energy Con Ad
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	1.030	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	PM E2S2 : Ft. Belvoir, VA	1.019	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	PM E2S2 : Ft. Belvoir, VA	1.984	-		-		-		-		-	Continuing	Continuing	Continuing
Operational Energy	MIPR	PM E2S2 : Fort Belvoir, VA	1.810	-		-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Assessment	MIPR	GVSC : Warren, MI	-	0.440	Sep 2021	-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			5.943	0.440		-		-		-		-	Continuing	Continuing	N/A

<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	4.421	4.000		4.000		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	Various	Multiple Vendors : TBD	3.045	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	Various	CERDEC : Fort Belvoir, VA	6.270	-		-		-		-		-	Continuing	Continuing	Continuing
Operational Energy	TBD	TBD : TBD (FY15)	3.158	-		-		-		-		-	Continuing	Continuing	Continuing
Metering and Monitoring Demo	Various	TBD : TBD	0.455	-		-		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603804A / Logistics and Engineer Equipment - Adv Dev				G11 / Adv Elec Energy Con Ad							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Tailored Log Support	MIPR	DLA : PHILADELPHIA,PA 19111	-	4.000	Sep 2021	-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Model & Simulation	Various	TBD : TBD	-	0.220		-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			18.099	8.220		4.000		-		-		-	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	2.495	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	2.255	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Control Systems	MIPR	CERDEC : Fort Belvoir, VA	2.932	-		-		-		-		-	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	1.857	-		-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			12.640	-		-		-		-		-	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / Logistics and Engineer Equipment - Adv Dev	<b>Project (Number/Name)</b> G11 / Adv Elec Energy Con Ad
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<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 (PPG)	MIPR	CERDEC : Fort Belvoir, VA	0.250	-		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP) Components	MIPR	CERDEC : Fort Belvoir, VA	1.969	-		-		-		-		-	Continuing	Continuing	Continuing
Hybrid Power Sources Components	MIPR	CERDEC : Fort Belvoir, VA	1.410	-		-		-		-		-	Continuing	Continuing	Continuing
Power Management and Distribution Systems	MIPR	CERDEC : Fort Belvoir, VA	2.011	-		-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Safety Release	MIPR	ABERDEEN TEST CENTER : ABERDEEN PROV GND,MD	-	0.140	Oct 2021	-		-		-		-	Continuing	Continuing	Continuing
Maneuverable Lightweight Electric Weight Reducer (MLEWR) Limited User Assessment	MIPR	ARCIC CENTER : FORT EUSTIS, VA	-	0.200	Oct 2021	-		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			5.640	0.340		-		-		-		-	Continuing	Continuing	N/A
<b>Project Cost Totals</b>			42.322	9.000		4.000		-		-		-	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2023 Army</b>		<b>Date: April 2022</b>
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> G11 / <i>Adv Elec Energy Con Ad</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
<b>PDISE Expansion</b>																												
TMS interface & test methodology development	█																											
<b>Lightweight portable power</b>																												
Modeling, Development and Test of lightweight portable power			█																									
<b>Maneuverable Lightweight Electric Weight Reducer (MLEWR)</b>																												
MLEWR Operational Assessment			█																									
MLEWR System Integration			█																									

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2023 Army		<b>Date:</b> April 2022
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	<b>Project (Number/Name)</b> 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	4	2020
Assess Technologies, such as STEP, to Meet Gaps-STEP	1	2016	2	2020
Develop prototypes for modular, scalable STEP systems	2	2020	4	2020
AMMPS Hybrid Power Integration	1	2020	2	2020
AMMPS Hybrid Technology Assessment	1	2020	2	2020
AMMPS Hybrid Prototype Development	3	2019	4	2020
PDISE Expansion	1	2017	2	2021
TMS interface & test methodology development	1	2019	2	2021
ASSESSMENT OF TECHNOLOGIES Across TEP line	1	2017	4	2020
Assess Technologies (remote start adapter) to Meet Gaps and Improve Efficiencies	1	2017	4	2020
OPERATIONAL ENERGY (OE)	1	2016	4	2019
Evaluation of OE-Related Impacts, Systems and Improvements	1	2016	4	2019
Lightweight portable power	2	2021	4	2022
Modeling, Development and Test of lightweight portable power	2	2021	4	2022
Maneuverable Lightweight Electric Weight Reducer (MLEWR)	4	2021	4	2022
MLEWR Operational Assessment	4	2021	4	2022
MLEWR System Integration	4	2021	4	2022