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

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force / BA 7: Operational Systems Development</i>	R-1 Program Element (Number/Name) PE 0305111F / <i>Weather Service</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
Total Program Element	-	34.618	39.228	11.716	0.000	11.716	13.318	14.303	14.343	14.665	Continuing	Continuing
672738: <i>Weather Service</i>	-	34.618	39.228	11.716	0.000	11.716	13.318	14.303	14.343	14.665	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

This program, BA 7, PE 0305111F, project 672738, Expeditionary Weather - MTA Rapid Fielding (ExMet - MTA RF), is a new start.

In FY 2023, a portion of PE 0305111F, Project 672738, Weather Service, was transferred to PE 1203940SF, Space Situational Awareness Operations, Project 67A018, Ground Based Space Environmental Monitoring in order to align current AF ground-based space sensing projects to the USSF.

A. Mission Description and Budget Item Justification

This budget activity funds the operational development necessary to acquire and modernize Air Force Weather Service (AFWS) capabilities in support of the 2018 National Defense Strategy's (NDS) three lines of effort. To improve readiness for a more lethal force, AFWS provides timely, accurate, resilient, and relevant environmental information to enable global battlespace situational awareness for the Air Force (AF), Army, Special Operations Forces (SOF), Space Force (USSF), combatant commands, the Intelligence Community (IC), and other government agencies. AFWS provides climate impacts and assessments, as well as space and terrestrial weather sensing, forecasting, and weather analytic capabilities, at home station and deployed, in order to deliver critical environmental information in support of decision makers to gain the asymmetric advantage during the full spectrum of air and space combat operations. AFWS decreases the risk to mission and risk to force by increasing the lethality, effectiveness, and survivability of Department of Defense (DoD) weapon systems. To strengthen alliances and partnerships, AFWS development efforts integrate DoD, government agency, commercial, and international partner environmental data and software with AFWS information systems for processing, storing, exploiting, and disseminating all-domain weather information for analysis, forecasting, mission integration, and greater interoperability. To ensure greater performance and affordability for the Department of the AF, AFWS sensors and information systems are being modernized through improvements to architecture and system efficiency, cybersecurity, joint all-domain command and control (JADC2) and sensing grid integration, migration to cloud computing, artificial intelligence and machine learning (AI/ML) initiatives, and expanding agile software development, rapid delivery, and integration practices. The AF Weather Enterprise digital transformation and cloud migration effort modernizes key capabilities providing the military advantage to accurately predict environmental impacts optimizing mission planning, targeting, weaponeering, mission execution, battle damage assessment, and space systems operations.

AFWS aligns activities under four capability areas: Weather Data Collection, Weather Data Analysis and Dissemination, Weather Forecasting, and Product Tailoring/Warfighter Applications (PTWA). This alignment ensures an integrated and systems-oriented approach to program management decisions. Of these four capability areas, three (Weather Data Analysis and Dissemination, Weather Forecasting, and PTWA) are addressed by APPN 3600, BA 07, PE 0305111F, Project 672738 - Weather Service. Effective FY 2021, a portion of the APPN 3600 funding and activities from Weather Data Analysis and Dissemination and Weather Forecasting were migrated to the PTWA capability area to better address development of applications, software, command and control (C2) system integration, and web interfaces that directly impact the warfighter within the Weather Application Rapid Production (WARPspeed) program of record. For FY 2021, WDA Increment 5 and WARPspeed programs of record were approved as Software Acquisition Pathway Programs and are now OSD-nominated APPN 3600 BA 08 FY23 pilot programs.

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<p>1. Weather Data Collection provides automated atmospheric and ground-based space environmental sensing capabilities at fixed and deployed locations worldwide. The data gathered by multiple sensor systems is exploited for environmental battlespace awareness, characterization, safety of flight, resource protection, and satellite anomaly assessments and impacts.</p> <p>2. Weather Data Analysis and Dissemination provides a cybersecure cloud computing-based platform supporting large-scale environmental data ingest, processing, and product generation, Continuous Integration/Continuous Delivery (CI/CD) and AI/ML environments for AFWS software development and deployment, and machine-to-machine dissemination of specific, mission-tailored weather data on-demand to support warfighter operations, weapon system interoperability, rapidly integrating into C2 nodes, and shortening the Combatant Commander kill chain. The Weather Data Analysis and Dissemination capability area includes activities for Weather Data Analysis Increment 5 (WDA Inc 5).</p> <p>3. Weather Forecasting provides global and regional advanced scientific numerical weather and climate prediction capabilities for automated, high-resolution forecast products supporting mission planning and execution with an emphasis on clouds, theater scale weather, aerosol/chemical constituents, hydrology, machine learning, and space environmental characterization. Weather Forecasting includes activities for Numerical Weather Modeling (NWM) and Space Weather Analysis and Forecast System (SWAFS). In FY 2023, the SWAFS portion of the APPN 3600 funding and activities from AF PE 0305111F, Weather Service, were transferred to the USSF PE 1203940SF, Space Situational Awareness Operations.</p> <p>4. Product Tailoring Warfighter Applications (PTWA) provides software applications that provide and enhance environmental information to support rapid warfighter decision-making. PTWA includes the program, Weather Applications Rapid Production (WARPspeed), which is a suite of software applications developed and delivered across multiple security classification levels. WARPspeed encompasses weather workflow tools and decision aids used to tailor terrestrial and space environmental information, which include both Forecaster-in-the-Loop (FITL) and automated machine-to-machine processes enhanced by AI/ML. WARPspeed leverages the WDA Inc 5 cloud computing, data processing, and CI/CD and AI/ML platforms to rapidly develop, deliver, and sustain software capabilities, whether deployed into the AF Weather Virtual Private Cloud (AFW-VPC) or to warfighter processing nodes at the edge. The PTWA program Joint Environmental Toolkit (JET) subsumed several software and web development efforts previously aligned under the Weather Data Analysis and Dissemination capability area in FY 2021 and was renamed to WARPspeed. PTWA and WARPspeed also includes the machine learning Global Synthetic Weather Radar (GSWR) capabilities, which were previously aligned under Weather Forecasting.</p> <p>Activities include research and analysis to support current program planning. Management Service costs include Federally Funded Research and Development Centers (FFRDC) and Advisory and Assistance Service (A&AS).</p> <p>The total cost of the ExMet Rapid Fielding Middle Tier of Acquisition effort is 34.8M, including RDT&E and procurement of prototype units. ExMet Rapid Fielding program is fully funded across the Future Years Defense Program.</p> <p>This requirement supports performance of a full financial audit as required by title 10 U.S.C. Chapter 9A, SEC 240-D.</p>		

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This program element may include necessary emergent or unanticipated civilian pay expenses required to manage, execute, and deliver 0305111F Weather Service for emergent or unanticipated weapon system capability.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	36.573	26.228	0.000	0.000	0.000
Current President's Budget	34.618	39.228	11.716	0.000	11.716
Total Adjustments	-1.955	13.000	11.716	0.000	11.716
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	13.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-1.305	0.000			
• Other Adjustments	-0.650	0.000	11.716	0.000	11.716

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

Project: 672738: *Weather Service*

Congressional Add: *Commercial Weather Data Pilot (CWDP) Program*

Congressional Add: *Research on Atmospheric Rivers*

Congressional Add Subtotals for Project: 672738

Congressional Add Totals for all Projects

	FY 2021	FY 2022
	9.634	10.000
	2.890	3.000
Congressional Add Subtotals for Project: 672738	12.524	13.000
Congressional Add Totals for all Projects	12.524	13.000

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

	FY 2021	FY 2022	FY 2023
Title: Expeditionary Weather - MTA Rapid Fielding (ExMet - MTA RF)	0.000	0.000	0.424
Description: Funding enables rapid fielding of Air Force Weather's Joint All-Domain Command and Control (JADC2) system of systems solution that supports mission specific launch and recovery operations via multi and single person UTCs. ExMet			

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>systems and capabilities address AF expeditionary operations needs highlighted in the 2018 NDS and AF/A3 Functional Concept for Expeditionary Weather operations. FY23 funding continues integration of components and applications into ExMET systems which was previously enabled by SBIR funding.</p> <p>FY 2022 Plans: N/A</p> <p>FY 2023 Plans: Funding will support component integration and testing.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Initiates use of 35111PE for component integration into overall ExMet scalable system configurations; was previously leveraging SBIR funding</p>				
<p>Title: Weather Data Analysis Increment 5 (WDA Inc 5)</p> <p>Description: WDA Inc 5 institutes a cloud computing-based platform enabling a transition from agile development to a CI/CD pipeline for software development and deployment efforts which will enable rapid updates to functionality and security measures. The WDA Inc 5 cloud computing platform will also provide an enterprise big data analytics capability and AI/ML platform, as well as supporting and funding development and deployment of web services, data management, platform monitoring, application on-boarding, and platform user management. Finally, the program will provide both classified and unclassified cloud computing platforms that communicate directly with C2 customers.</p> <p>FY 2022 Plans: FY 2022 funding will support the CI/CD pipeline modernization for weather software and applications and will further AI/ML platform integration and data integration to the AFW-VPC platform.</p> <p>FY 2023 Plans: Funding will support the CI/CD pipeline modernization for weather software and applications and will further AI/ML platform integration and new satellite data integration to the AFW-VPC platform</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decreased due to BA-08 Software Pilot Program transfer to new PE 0308607F.</p>		0.736	1.972	0.000
<p>Title: Numerical Weather Modeling (NWM)</p> <p>Description: The NWM program transitions High Performance Computing (HPC) System 11 into operations in early FY2022, transitions legacy weather models to System 11 by end of FY 2022, and expands and enhances the computing capability to begin supporting machine learning models' development. NWM also provides data and products used to issue advisories and warnings</p>		8.824	11.080	11.292

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
for DoD resource protection, as well as DoD and IC mission planning. NWM integrates with the Air Force Weather Weapon System's Weather Data Analysis (WDA) Inc 5 processing centers to analyze and predict weather phenomena.				
<p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Continue METSAT exploitation and integration efforts for cloud forecasting applications. - Continue terrain modeling enhancement and integration, which includes hydrology streamflow capability and seasonal-to-sub-seasonal forecast capability development. - Continue Oak Ridge National Laboratory (ORNL) RDT&E collaboration tasks, focusing on model code optimization and hydrology prediction capabilities. - Continue Explicit Modeled Cloud data assimilation collaboration and development activities <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> - Continue METSAT exploitation and integration efforts for cloud forecasting applications. - Continue terrain modeling enhancement and integration, which includes hydrology streamflow capability and seasonal-to-sub-seasonal forecast capability development. - Continue Oak Ridge National Laboratory (ORNL) RDT&E collaboration tasks, focusing on model code optimization and hydrology prediction capabilities. <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p> <ul style="list-style-type: none"> -Slight increase due to cuts/inflation rates administered to NWM 				
<p>Title: Weather Applications Rapid Production (WARPspeed)</p> <p>Description: WARPspeed develops and delivers a suite of software applications across multiple security classification levels to provide and enhance environmental intelligence to support rapid warfighter decision making. Major software developments include: the BIFROST Portal (formally Enterprise Environmental Platform (E2P)), Mission Services, Global Synthetic Weather Radar (GSWR), weather C2 visualization plug-ins and integration, and other forecast and climatology applications.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Develop BIFROST Portal which will provide a single front entry point into the Air Force Weather Enterprise for all html-based capabilities for environmental content and services on all classification enclaves. - Continue to enhance Mission Services, to include the continued development of environmental impacts web services. - Continue to develop weather C2 visualization plug-ins to integrate weather data and software applications with various C2 systems. <p>FY 2023 Plans:</p>		8.581	9.689	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> - Continue E2P which will provide a single front entry point into the Air Force Weather Enterprise for all html-based capabilities for environmental content and services on all classification enclaves. - Continue to enhance Mission Services, to include integration of contrails and cloud-free line of sight machine learning-based forecasts into environmental impacts web services. - Continue to develop weather C2 visualization plug-ins to integrate weather data and software applications with various C2 systems. <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decreased due to BA-08 Software Pilot Program transfer to new PE 0308607F.</p>				
<p>Title: Space Weather Analysis and Forecast System (SWAFS)</p> <p>Description: The SWAFS legacy baseline is currently being redesigned and upgraded under the Space Domain Awareness Environmental Toolkit for Defense (SET4D) effort to satisfy Space Domain Awareness goals for a modern cloud hosted infrastructure that is cyber resilient and integrated with the Unified Data Library. The Energetic Charged Particle Hazard Assessment System (ECP HAS) is one of several models and applications within the SET4D environment designed to inform satellite operators of hazards and the impacts of those hazards to their spacecraft that will provide warfighters with the environmental awareness to safely sustain their respective orbits and missions.</p> <p>FY 2022 Plans:</p> <ul style="list-style-type: none"> - Complete transition of four of five components of the hazard assessment system to a cloud infrastructure. This phase of the ECP HAS will provide warfighters with a modern user interface to determine the hazards to space vehicles at low-earth orbit (LEO) and GPS satellites' altitudes. - Begin transition of the final component of the hazard assessment system to a cloud infrastructure. This phase of the ECP HAS will provide the warfighter with the final of four physics models to specify the hazards to space vehicles in geostationary and highly-elliptical orbits. - Begin integration of a cloud-ready ionospheric assimilation model. This model will support warfighters with cloud-hosted, enhanced characterization of the ionospheric impacts to DoD and IC systems. - Rapidly respond to implement system resiliency and situational awareness necessary to operate in the contested space domain. Activities may include, but are not limited to, program office support, studies, technical analysis, prototyping, etc. <p>FY 2023 Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>		3.953	3.487	0.000

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
N/A				
Accomplishments/Planned Programs Subtotals		22.094	26.228	11.716
		FY 2021	FY 2022	
Congressional Add: Commercial Weather Data Pilot (CWDP) Program		9.634	10.000	
<p>FY 2021 Accomplishments: Reviewed all new Broad Agency Announcement (BAA) white papers and request proposals, while working with NWS and USSF to ensure cost savings and mitigation of redundancy through data sharing agreements between government/DoD agencies.</p> <ul style="list-style-type: none"> - Awarded 2 new contracts to Boston College and Joint Center for Satellite Data Assimilation (JCSDA). Efforts facilitate commercial space weather collections and streamlined integration of commercial data into weather models - Awarded a new contract to Tomorrow.io for a commercial global precipitation monitoring small satellite constellation. The commercial data will be integrated into and used as training data for current and future weather applications utilizing machine learning/artificial intelligence. - Provided stakeholders' interim and final reports from PlanetIQ, interim report and awarded no-cost extension for GeoOptics, and interim report from John Hopkins University. The efforts explore how commercial weather data can be used to fill in environmental sensing for data sparse regions, such as the Arctic and polar regions. <p>FY 2022 Plans: FY22 CWDP 10M funding, 2.5M will go to Tomorrow.io (with AFWERX matching) and 7.5M is dedicated to the DIU Commercial Solution Offerings process.</p>				
Congressional Add: Research on Atmospheric Rivers		2.890	3.000	
<p>FY 2021 Accomplishments: Reviewed all new BAA white papers and request proposals.</p> <ul style="list-style-type: none"> - Supported AF Reserve Hurricane Hunters' RDT&E efforts for Atmospheric River dropsonde observations and reconnaissance flights. - Incrementally funded the second year of the Improving Predictions of Atmospheric Rivers project and build upon research efforts begun in FY20 to forecast improvements of landfall location and intensity of Atmospheric Rivers, as well as their associated heavy flooding threats and potential landslide impacts. - Awarded additional Atmospheric Rivers and associated enhanced weather RDT&E tasks, to include areas of research such as Hurricane Hunter dropsonde and classified data assimilation, coupled modeling, contrail 				

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	FY 2021	FY 2022
forecasting and model blending development through quantification of impacts of increased observations on model performance.		
FY 2022 Plans: Will analyze and evaluate the impact of assimilating the Atmospheric Rivers (AR) recon flight-level, dropsonde, and buoy data with the JEDI/Model for Prediction Across Scales (MPAS) system, with the goal to generate improved initial conditions and short-range forecasts and simulations of cloud fields in the presence of atmospheric rivers.		
Congressional Adds Subtotals	12.524	13.000

D. 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>
• OPAF 03 Line Item 833070: <i>Weather Observation Forecast</i>	33.021	32.376	34.849	-	34.849	33.489	34.110	34.827	-	Continuing	Continuing
• RDTE 04 0604002F: <i>Air Force Weather Services Research</i>	2.234	0.986	0.792	-	0.792	0.819	0.833	0.850	-	Continuing	Continuing

Remarks

E. Acquisition Strategy

AF Weather is adopting a CI/CD approach to delivering capabilities rapidly and routinely using multiple contracts to support a family of systems through development fielding and sustainment.

Cost Plus contracts are utilized for software development and sustainment and Fixed Firm Price contracts for Commercial-off-the-shelf (COTS) systems and Contract Logistics Support (CLS) efforts. Pre-competed General Services Administration (GSA) and Defense MicroElectronics Activity (DMEA) contract vehicles are leveraged when appropriate, and competitive and small-business awards are favored.

The Air Force Program Executive Officer for Digital (AFPEO Digital) and a Space Force Program Executive Officer under Space Systems Command (SSC) are the PEOs for the AFWS. AFPEO Digital manages the ground-based atmospheric sensing and data analysis, atmospheric forecast systems, and PTWA. The SSC PEO manages the ground-based segments of space environment collection platforms as well as SWAFS.

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

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Product Development (\$ in Millions)				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			
ExMet	C/CPAF	Not specified. : TBD	-	-		-		0.424	Mar 2023	-		0.424	Continuing	Continuing	-
WDA INC 5, Develop web service, big data analytics, and ML/AI platform capabilities	C/CPAF	NextGen Federal Systems : Morgantown, WV	-	0.736	Jun 2021	1.962	Feb 2022	-		-		-	Continuing	Continuing	-
WARPspeed (BIFROST, Mission Services, GSWR)	Various	Various : Various	-	7.034	May 2021	8.677	Feb 2022	-		-		-	Continuing	Continuing	-
Commercial Weather Pilot Program	C/FFP	Various : Various	-	9.634	Jun 2021	10.000	Jun 2022	-		-		-	Continuing	Continuing	-
Research on Atmospheric Rivers	Various	Various : Various	-	2.890	Jun 2021	3.000	Jun 2022	-		-		-	Continuing	Continuing	-
Enhanced Weather Prediction	Various	Various : Various	-	-		-		-		-		-	Continuing	Continuing	-
NWM 1 - Perform software enhancements to the mesoscale production model	MIPR	NCAR : Boulder, CO	-	1.856	Jun 2021	-		-		-		-	Continuing	Continuing	-
NWM 2 - Improve land information system (LIS) application, providing earth surface boundary characterization for numerical modeling	Reqn	NASA : Greenbelt, MD	-	3.031	Jan 2021	-		-		-		-	Continuing	Continuing	-
NWM - Develop and improve data assimilation techniques, system/ software optimization, and expanded system ingest/ integration for enhanced modeling capabilities	Various	Various : Various	-	2.855	May 2021	8.967	Jan 2022	9.693	Jan 2023	-		9.693	Continuing	Continuing	-
WS-LVC	C/CPIF	Northrop Grumman : Bellevue, NE	-	-		-		-		-		-	Continuing	Continuing	-
SWAFS Magnetospheric Energized Charged Particle (ECP) Hazard	PO	AFRL : Annapolis, MD	-	3.035	Jan 2021	2.781	Jan 2022	-		-		-	Continuing	Continuing	-

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

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Product Development (\$ in Millions)				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			
Assessment System (HAS) Model Integration															
SWAFS Cloud Transition Prep	C/FFP	Perspecta : Herndon, VA	-	0.418	Oct 2020	-		-		-		-	Continuing	Continuing	-
Subtotal			-	31.489		35.387		10.117		-		10.117	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				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			
46th TS/JITC AFLCMC	WR	46 TS : Offutt AFB, NE	-	0.166	Dec 2020	0.197	Dec 2021	0.111	Dec 2022	-		0.111	Continuing	Continuing	-
Subtotal			-	0.166		0.197		0.111		-		0.111	Continuing	Continuing	N/A

Management Services (\$ in Millions)				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			
Program Management Administration AFLCMC	C/CPFF	AFLCMC : Hanscom AFB, MA	-	2.463	Oct 2020	2.938	Oct 2021	1.488	Oct 2022	-		1.488	Continuing	Continuing	-
FFRDC SMC	RO	Aerospace Corp : El Segundo, CA	-	0.500	Jan 2021	0.706	Jan 2022	-		-		-	Continuing	Continuing	-
Subtotal			-	2.963		3.644		1.488		-		1.488	Continuing	Continuing	N/A

			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	34.618	39.228	11.716	-	11.716	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force **Date:** April 2022

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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

<i>Weather Service</i>	
Weather Data Analysis Inc 5 Build A Deliveries	
Weather Data Analysis Inc 5 Build B Deliveries	
WARPspeed Build A Deliveries	
WARPspeed Build B Deliveries	
Numerical Weather Modeling Deliveries	
SWAFS- Energetic Charged Particle Hazard Assessment model (ECP HAS) Integration	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Weather Service</i>				
Weather Data Analysis Inc 5 Build A Deliveries	1	2021	4	2023
Weather Data Analysis Inc 5 Build B Deliveries	1	2024	4	2026
WARPspeed Build A Deliveries	1	2021	4	2023
WARPspeed Build B Deliveries	1	2024	4	2026
Numerical Weather Modeling Deliveries	1	2021	4	2026
SWAFS- Energetic Charged Particle Hazard Assessment model (ECP HAS) Integration	1	2021	4	2022