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Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	496.316	23.750	24.457	23.258	-	23.258	25.405	25.795	26.168	26.704	Continuing	Continuing
0401: <i>Shipboard Waste Mgmt</i>	374.622	10.051	11.615	11.260	-	11.260	12.475	12.622	12.731	12.984	Continuing	Continuing
0817: <i>Environmental Sustainability Development (NESDI)</i>	74.250	5.151	6.010	5.161	-	5.161	5.962	6.079	6.201	6.332	Continuing	Continuing
9204: <i>Marine Mammal Research</i>	47.444	6.241	6.832	6.837	-	6.837	6.968	7.094	7.236	7.388	Continuing	Continuing
9210: <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>	0.000	2.307	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.307

A. Mission Description and Budget Item Justification

This program develops and evaluates processes, hardware, systems, operational procedures, scientific methods, and environmental studies that will allow the Navy to operate in U.S., foreign, and international waters, air, space, and land areas while complying with environmental laws, regulations, Executive Orders, policies and international agreements.

Many environmental laws, regulations, and policies impose restrictions on Navy training and testing, vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance. The projects for this Program Element (PE) support the Navy's compliance with the (a) Clean Water Act; (b) Act to Prevent Pollution from Ships; (c) International Convention for the Prevention of Pollution from Ships; (d) DoD Manual 4715.06, "Regulations on Vessels Owned or Operated by the Department of Defense," Vol 1-4; (e) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990; (f) National Invasive Species Act of 1996; (g) Ballast Water Management for Control of Nonindigenous Species in Waters of the United States; (h) Clean Air Act; (i) Federal Insecticide, Fungicide, and Rodenticide Act; (j) Marine Mammal Protection Act; (k) Endangered Species Act; (l) Comprehensive Environmental Response, Compensation, and Liability Act; and (m) Resource Conservation and Recovery Act. References (a) through (m) establish Level I environmental protection requirements. Project 0401, Shipboard Waste Management, supports efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Technical Authority, (2) Liquid Wastes, (3) Hazardous Material Control and Management, (4) Ballast Water Management, (5) Solid Waste Management, and (6) Copper-Free and Low Copper Antifouling.

Environmental Sustainability Development (NESDI) identifies pervasive Navy shore side environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy.

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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>
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The Marine Mammal Research (MMR) program is responsible for applied research and works to address the Navy's key research needs and transition the results and technologies for use within the Navy's at-sea environmental compliance and permitting processes in compliance with the Marine Mammal Protection Act and the Endangered Species Act, with the goals of improving marine species impact analysis (including marine mammal take estimates), mitigation measures and monitoring capabilities. Key points of the MMR mission are: (1) Improve the best available science regarding the potential impacts to marine species from Navy activities, (2) Expand the technology and methods available to the U.S. Navy marine species monitoring program (3) Preserve core Navy readiness capabilities. This funding allows the Navy to avoid or reduce the chances of costly litigation for non-compliance.

The primary focus areas addressing the Red Hill tank fuel leaks are: (1) Water Resilience - investigate and demonstrate enhanced water resiliency technologies. (2) Hydrogeology - oversee the development of an independent and representative hydrogeologic model. (3) Innovation Initiatives - implement innovation challenges and Capstone student project based on problem statements relating to the Red Hill tanks. (4) Tank Cleaning Verification Technologies - oversee the demonstrate of ultraviolet Fluorescence to verify the cleaning of the Red Hill tanks.

B. Program Change Summary (\$ in Millions)	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025 Base</u>	<u>FY 2025 OCO</u>	<u>FY 2025 Total</u>
Previous President's Budget	21.647	24.457	24.448	-	24.448
Current President's Budget	23.750	24.457	23.258	-	23.258
Total Adjustments	2.103	0.000	-1.190	-	-1.190
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.400	0.000			
• SBIR/STTR Transfer	-0.297	0.000			
• Program Adjustments	0.000	0.000	0.530	-	0.530
• Rate/Misc Adjustments	0.000	0.000	-1.720	-	-1.720

Change Summary Explanation

FY 2025 programmatic increase of \$0.530M is due to investments in a land-based incinerator test and training site as well as alternate refrigerant identification and testing. FY 2025 was reduced by \$1.720M for misc. rate adjustments.

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Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
0401: <i>Shipboard Waste Mgmt</i>	374.622	10.051	11.615	11.260	-	11.260	12.475	12.622	12.731	12.984	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Navy ships and submarines operate and visit U.S. and international waters and ports where environmental restrictions impact the movements and operations of Navy vessels. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in U.S. and international waters without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance.

Navy vessels must comply with the following applicable environmental legal requirements for continued access to all waters for operations, exercises, training, and port access:

- (a) Clean Water Act;
- (b) Act to Prevent Pollution from Ships;
- (c) International Convention for the Prevention of Pollution from Ships;
- (d) DoD Manual 4715.06, "Regulations on Vessels Owned or Operated by the Department of Defense," Vol 1-4;
- (e) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990;
- (f) National Invasive Species Act of 1996;
- (g) Ballast Water Management for Control of Nonindigenous Species in Waters of the United States;
- (h) Clean Air Act;
- (i) Federal Insecticide, Fungicide, and Rodenticide Act;
- (j) Marine Mammal Protection Act;
- (k) Endangered Species Act;
- (l) Comprehensive Environmental Response, Compensation, and Liability Act; and
- (m) Resource Conservation and Recovery Act

PE 0603721N Environmental Protections, Project 0401, Shipboard Waste Management, supports efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Technical Authority, (2) Liquid Wastes, (3) Hazardous Material Control and Management, (4) Ballast Water Management, (5) Solid Waste Management, and (6) Copper-Free and Low Copper Antifouling.

The Shipboard Waste Management Program supports two designated Technical Warrant Holders for Environmental Systems & Materials Engineering, with responsibility and accountability for ensuring that ships and submarines are designed and upgraded, and can be operated, in compliance with existing and anticipated environmental requirements while minimizing total ownership cost and manning. This responsibility encompasses legacy platforms and new vessel designs, as well as Fleet operations exercises, and training. Major performers are Naval Surface Warfare Centers at Carderock, MD, and Philadelphia, PA, where engineering agents execute research and development responsibilities for Navy surface ship and submarine environmental engineering, which includes reviewing/updating various military specifications, ship specifications, DoD/CNO documentation, and maintaining the technology identification and assessment process.

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Title: Technical Authority</p> <p align="right">Articles:</p> <p>Description: Funding in support of Technical Authority (TA) is utilized to develop waste stream design criteria and guidance. This includes system/technology selection, processing capacity, interfaces, shipboard integration, test and qualification protocols, processes and practices, performance specifications, and development of ship requirement packages for various waste streams.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue to update the Ship Oil Spill Database, analyze oil spill root causes and identify policy/training/hardware deficiencies to reduce oil discharges/violations. - Publish USS San Antonio (LPD 17) Class specific guidance on oil spill prevention and response to reduce ship oil spill discharge violations. - Investigate alternative low-Global Warming Potential refrigerants for shipboard use in air conditioning and refrigerator units. - Continue to work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy. - Continue meetings with the North Atlantic Treaty Organization (NATO) and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance. - Continue development of environmental equipment/system requirements documentation, design criteria/guidance, standards, and certification protocols based on evolving regulations and policy. - Perform annual assessments of emergent air and water emission processes and technologies to enable effective compliance at minimal lifecycle cost and risk to operations. <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Continue to update the Ship Oil Spill Database, analyze oil spill root causes and identify policy/training/hardware deficiencies to reduce oil discharges/violations. - Draft USS Freedom (LCS 1) Class and USS Independent (LCS 2) Class specific guidance on oil spill prevention and response to reduce ship oil spill discharge violations. - Continue to investigate alternative low-Global Warming Potential refrigerants for shipboard use in air conditioning and refrigerator units. - Continue to work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy. - Continue meetings with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance. 	1.126	1.584	1.284	0.000	1.284
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
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- Continue development of environmental equipment/system requirements documentation, design criteria/guidance, standards, and certification protocols based on evolving regulations and policy.
 - Perform annual assessments of emergent air and water emission processes and technologies to enable effective compliance at minimal lifecycle cost and risk to operations.

FY 2025 OCO Plans:

N/A

FY 2024 to FY 2025 Increase/Decrease Statement:

FY25 decrease due to rate adjustments.

Title: Liquid Wastes

Articles:

2.100	2.500	2.400	0.000	2.400
-	-	-	-	-

Description: This effort addresses liquid wastes in two (2) major areas: Oil Pollution Abatement (OPA) and Non-Oily Waste (NOW). Funding will be utilized to assess new commercial off-the-shelf (COTS), modified COTS, and developmental products and technologies for application to Navy ships and submarines. The funding will also be utilized to develop and demonstrate detailed system and performance specifications and design guidance for the acquisition of cost effective shipboard liquid waste management solutions that meet existing and anticipated environmental requirements within the constraints of shipboard performance, reliability, and warship-unique requirements. In addition, the effort will seek common solutions across platforms, and where possible, across the Fleet to provide lifecycle cost savings, logistical efficiency, and improved Fleet familiarity.

FY 2024 Plans:

Oil Pollution Abatement (OPA):

- Continue shipboard evaluation of centrifugal oil/water separator (OWS).
- Develop Integrated Logistics Support (ILS) for centrifugal OWS implementation.
- Continue transition efforts for centrifugal OWS Fleet implementation.
- Complete environmental testing (e.g., electromagnetic interference (EMI), vibration, and shock testing) of ultraviolet (UV)-fluorescence based oil content monitor (OCM).
- Conduct laboratory evaluation of submersible pumps.
- Develop and issue bilge cleaner request for information (RFI).
- Evaluate responses to bilge cleaner RFI.
- Demonstrate membrane regeneration software end evaluate alternate membrane cleaners.
- Determine suitability of alternative transfer pumps.
- Develop transfer pump test protocol and strategy.

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Non-Oily Waste (NOW):</p> <ul style="list-style-type: none"> - Complete laboratory evaluation of alternative vacuum pumps. - Begin laboratory evaluation of pressed fittings. - Continue evaluation of effects of pipe scale prevention product application periodicity changes on USS Arleigh Burke (DDG 51) Class ships. - Complete environmental testing of hydrogen sulfide (H2S) detectors. - Complete shipboard evaluation of Vacuum Collection, Holding and Transfer (VCHT) ejector flapper material changes. <p>FY 2025 Base Plans:</p> <p>OPA:</p> <ul style="list-style-type: none"> - Continue shipboard evaluation of centrifugal OWS. - Evaluate suitability of prototype militarized centrifugal OWS for Fleet implementation. - Develop draft bilge cleaner Commercial Item Description (CID). - Develop membrane regeneration procedures for Fleet implementation. - Identify oil/water separators for small ships to support next generation Modified Off the Shelf (MOTS) OPA technology evaluations. - Continue to determine suitability of alternative transfer pumps. - Continue to develop transfer pump test protocol and strategy. <p>NOW:</p> <ul style="list-style-type: none"> - Complete laboratory evaluation of pressed fittings. - Complete evaluation of effects of pipe scale prevention product application periodicity changes on DDG 51 Class ships. - Develop CID for H2S detectors. - Transition new ejector flapper material changes into Fleet. - Investigate how to implement Vacuum Instrumentation Isolators (VIIs) into Fleet. <p>FY 2025 OCO Plans:</p> <p>N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p> <p>FY25 decrease due to rate adjustments.</p>					
Title: Hazardous Material Control and Management	0.857	1.000	0.900	0.000	0.900

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Articles:	-	-	-	-	-
<p>Description: A wide variety of Hazardous Materials (HM) are used to construct, operate and maintain Navy ships and submarines. These HMs include cleaning compounds, solvents, adhesives, sealants, corrosion preventive compounds, acids, alkalis, oxidizers, lubricants, functional fluids, and many other products. Hazardous Material Control and Management (HMC&M) addresses environmental, safety, and health risks to ship construction workers, Ship's Force (S/F), and shipyard workers.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue assessments of emergent COTS HM management processes and pollution prevention technologies that would enable effective compliance at minimal life cycle cost and risk to operations. - Continue to identify HM control and pollution prevention systems for detailed acquisition and evaluation. - Continue laboratory evaluation of paint can crusher as HM offload cost avoidance method - Continue to assess less hazardous or non-hazardous substitutes for high-risk HM regulated under Toxic Substance Control Act (TSCA). - Continue identifying and implementing alternatives to known human carcinogens (KHC) - Continue identifying and implementing alternatives to Polychlorinated Biphenyls (PCB) containing items - Continue assessing procurement and offload data to identify HM and pollution prevention trends <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Continue assessments of emergent COTS HM management processes and pollution prevention technologies that would enable effective compliance at minimal life cycle cost and risk to operations. - Continue to identify HM control and pollution prevention systems for detailed acquisition and evaluation. - Continue laboratory evaluation of paint can crusher as HM offload cost avoidance method - Continue to assess less hazardous or non-hazardous substitutes for high-risk HM regulated under Toxic Substance Control Act (TSCA). - Continue identifying and implementing alternatives to known human carcinogens (KHC) - Continue identifying and implementing alternatives to Polychlorinated Biphenyls (PCB) containing items - Continue assessing procurement and offload data to identify HM and pollution prevention trends <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease due to rate adjustments.</p>					
Title: Ballast Water Management	4.213	3.631	3.397	0.000	3.397

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
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<p align="right">Articles:</p> <p>Description: The National Invasive Species Act of 1996 (NISA) requires the Secretary of Defense to implement a Ballast Water Management (BWM) program to minimize the risk of introduction of non-indigenous species (NIS) and pathogens from releases of ballast water from seagoing vessels of the DoD.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Conduct operational testing of the compact-sized Modified Off-the-Shelf (MOTS) ballast water treatment system (BWTS) aboard M/V Cape Washington or alternate test site. - Conduct environmental testing of the compact-sized MOTS BWTS. - Conduct factory inspection and factory acceptance testing of the standard-sized MOTS BWTS. - Initiate operational test planning for the standard-sized MOTS BWTS. - Initiate environmental test planning for the standard-sized MOTS BWTS. <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Complete final technical data package and obtain Navy type approved compact-sized BWTS. - Complete operational testing of the standard-sized MOTS BWTS. - Conduct environmental testing of the standard-sized MOTS BWTS. <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease due to rate adjustments.</p>	-	-	-	-	-
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<p>Title: Solid Waste Management</p> <p align="right">Articles:</p> <p>Description: Solid Waste Management (SWM) supports the Act to Prevent Pollution from Ships (APPS), which regulates all garbage discharges from ships at sea.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Complete and finalize NextGen PWP/SWP Prototype Development for log making and briquetting systems - Modify waste processing equipment for special solid waste based on shipboard test and evaluation results. - Continue laboratory evaluation of Navy Solid Waste Shredder upgrades to match NextGen PWP processing rates 	1.590	2.700	3.079	0.000	3.079
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>- Evaluate shipboard integration of PWP/SWP</p> <p>FY 2025 Base Plans:</p> <ul style="list-style-type: none"> - Conduct environmental testing of Navy Prototype solid waste system. - Navy PWP/SWP Pre Production Prototype design and build - Complete shipboard evaluation and environmental testing of modified Navy Solid Waste Shredder - Continue to evaluate shipboard integration of PWP/SWP <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 increase to develop the next generation plastic waste processing system; and to develop the land-based incinerator test site (LBITTS) and incinerator training material, which will provide In-Service Engineering Agents (ISEAs) and other stakeholders the opportunity to conduct research and development efforts for technology enhancements.</p>					
<p>Title: Copper-Free and Low Copper Antifouling</p> <p align="right">Articles:</p> <p>Description: The copper discharges from underwater hull coatings remain a regulatory concern. The effort focuses on characterizing advanced coating systems (copper-containing, copper-free, and low copper) and their suitability for Navy-unique operational factors such as speed time profiles, drydocking intervals, and maintenance practices. The biofouling pressure at Navy homeports is also being characterized in order to inform hull and, especially, propeller cleaning scheduling.</p> <p>FY 2024 Plans:</p> <ul style="list-style-type: none"> - Continue evaluating the performance of the Hempel X7 antifouling fouling-release test coating on USS Mitscher (DDG 57). - Continue assessment of emergent commercial antifouling coatings. - Initiate evaluation of aged coatings (e.g., biocide leaching, effectiveness, and environmental impact). - Complete biofouling pressure surveys at Naval Station Norfolk (NAVSTA Norfolk) and Joint Expeditionary Base Little Creek (JEB Little Creek). - Continue biofouling pressure surveys at Naval Station Mayport (NAVSTA Mayport) and Naval Station San Diego (NAVSTA San Diego). <p>FY 2025 Base Plans:</p>	0.165	0.200	0.200	0.000	0.200
	-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<ul style="list-style-type: none"> - Continue to evaluate the performance of the Hempel X7 antifouling fouling-release test coating on DDG 57. - Continue biofouling pressure surveys at NAVSTA Mayport and NAVSTA San Diego. - Continue to assess emergent commercial antifouling coatings. - Continue evaluation of aged coatings. - Initiate niche area evaluation and control of biofouling. <p><i>FY 2025 OCO Plans:</i> N/A</p> <p><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> No change from FY24.</p>					
Accomplishments/Planned Programs Subtotals	10.051	11.615	11.260	0.000	11.260

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

Remarks

D. Acquisition Strategy

RDT&E,N Contracts are Competitive Procurements.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
Ancillary Hardware Development	Various	Misc. Contracts : Not Specified	19.149	0.000		0.000		0.000		-		0.000	0.000	19.149	Continuing
Primary Hardware Development	C/CPFF	Oceaneering : Not Specified	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	Continuing
Systems Engineering	C/CPFF	John J. McMullen & Son : Not Specified	4.487	0.000		0.000		0.000		-		0.000	0.000	4.487	Continuing
Subtotal			24.636	0.000		0.000		0.000		-		0.000	0.000	24.636	N/A

Support (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
Software Development	WR	SPAWAR : Charleston, SC	10.838	0.000		0.000		0.000		-		0.000	0.000	10.838	Continuing
Subtotal			10.838	0.000		0.000		0.000		-		0.000	0.000	10.838	N/A

Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
Developmental Test & Evaluation (DT&E)	WR	NSWCCD, Bethesda, MD : Bethesda, MD	249.696	8.211	Oct 2022	8.310	Oct 2023	8.742	Oct 2024	-		8.742	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NRL, Wash, DC : Wash, DC	34.287	0.225	Oct 2022	1.225	Oct 2023	0.225	Oct 2024	-		0.225	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWCPD, Philadelphia, PA : Philadelphia, PA	3.189	0.985	Oct 2022	1.000	Oct 2023	1.213	Oct 2024	-		1.213	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	DOT-MARAD : Washington, DC	12.308	0.500	Oct 2022	0.000	Oct 2024	0.000	Oct 2024	-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	Misc. Govt Labs : TBD	23.880	0.100	Oct 2022	0.100	Oct 2023	0.100	Oct 2024	-		0.100	0.000	24.180	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
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

SHIPBOARD WASTE MANAGEMENT																												
Technical Authority																												
Liquid Wastes																												
Hazardous Material Control and Management																												
Ballast Water Management																												
Solid Waste Management																												
Copper-Free and Low Copper Antifouling																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>SHIPBOARD WASTE MANAGEMENT</i>				
Technical Authority	1	2023	4	2029
Liquid Wastes	1	2023	4	2029
Hazardous Material Control and Management	1	2023	4	2029
Ballast Water Management	1	2023	4	2029
Solid Waste Management	1	2023	4	2029
Copper-Free and Low Copper Antifouling	1	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
0817: <i>Environmental Sustainability Development (NESDI)</i>	74.250	5.151	6.010	5.161	-	5.161	5.962	6.079	6.201	6.332	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The vision outlined in "A Design for Maintaining Maritime Superiority, Version 2.0" (December 2017) and "2018 National Defense Strategy of the United States of America" is for our Navy to become more lethal, resilient and a rapidly innovating joint force. We must maintain a fleet that is trained ready to operate and fight decisively. Today's reality requires training and operating within environmental constraints (national and international laws and agreements) and searching for alternatives to comply with and alleviate those constraints. Moreover, as we develop new systems and technologies in support of the National Defense Strategy, the Navy must anticipate and address potential environmental constraints which could in the future adversely impact our ability to protect and sustain our forces at home and abroad.

This program identifies pervasive Navy shore side environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy.

Environmental Enabling Capabilities -2 (EEC-2) MAXIMIZE TRAINING AND TESTING RANGE REQUIREMENTS WITHIN ENVIRONMENTAL CONSTRAINTS: This capability addresses environmental impacts and restrictions at Navy land and sea ranges, including munitions testing and manufacturing, to ensure Navy ranges are available to conduct required training and testing operations for the Fleet. Investments in EEC-2 provide validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test ranges to maximize the availability and utilization of the ranges. The results support operational readiness by providing the tools and technologies necessary for sustaining and managing Navy land and sea ranges related to unexploded ordnance (UXO) and munitions, encroachment, air quality, airborne noise, water quality, and wetlands. Capabilities gained include the ability to assess and determine the risks from underwater UXO, the evaluation and prioritization of ordnance contaminated sites for evaluation in environmental programs and the implementation of range specific best management practices by evaluating and modeling available process, procedures, and technologies.

Environmental Enabling Capabilities-3 (EEC-3) PLATFORM MAINTENANCE AND REPAIR WITH MINIMAL ENVIRONMENTAL FOOTPRINT: This capability focuses on minimizing or eliminating environmental impact related to Navy and Marine Corps weapon system repair and maintenance operations. Investments in EEC-3 provide valid knowledge, models, processes, and technologies to minimize regulated emissions, discharges and hazardous material usage during the repair and maintenance of ships, submarines, and surface/sub-surface vehicles and aircraft and air vehicles. The program supports Fleet operational readiness and Navy acquisition communities by investing in information to understand emerging environmental requirements and to develop innovative processes and technologies that result in savings while reducing the fleet environmental constraints related to platform maintenance. Capabilities and benefits gained include, but are not limited to, the reduction in the usage

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>
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of heavy metals used in metal finishing (chromium and cadmium), reduced hazardous air pollutant (HAP) emissions, the development of best management practices and tools to minimize the use of hazardous materials, and the generation of hazardous wastes associated with maintaining and repairing ships, submarines, aircraft, and unmanned vehicles. Results of program investments will be leveraged across weapon system and platform acquisition to ensure continued reduction in lifecycle costs and long-term environmental compliance burdens to the Fleet.

Environmental Enabling Capabilities-4 (EEC-4). SUPPORT SHORE READINESS WITHIN ENVIRONMENTAL CONSTRAINTS: Naval shore establishment requires the capability to operate and maintain facilities and provide waterfront and airfield services to the fleet while complying with applicable environmental regulations and minimizing environmental impacts and costs. The program invests in knowledge and innovative processes and technologies that minimize infrastructure and operational costs, regulated emissions, while minimizing discharges and hazardous material usage from ship (waterfront) and aviation operations. Capabilities and benefits gained under EEC-4 include, reduced costs associated with wastewater treatment, elimination/reduction in the use of HAPs, ozone depleting substances (ODSs), volatile organic compounds (VOCs) and the associated reporting requirements, reduced hazardous waste and disposal costs, and improved storm water management.

Environmental Enabling Capabilities-5 (EEC-5). COST-EFFECTIVE MANAGEMENT OF ENVIRONMENTAL REGULATORY REQUIREMENTS: The environmental compliance regulations require base managers to permit, monitor and report on many processes associated with weapon system and platform operations. Naval shore environmental managers require the capability to efficiently and cost effectively manage these compliance requirements. Under EEC-5, the program invests in improved data collection, methods, and models to assess environmental impacts and ecological risk assessments of Naval Operations on harbors, U.S. waterways, and surrounding communities. Benefits include gaining standardized technical environmental management improvements/techniques related to source control, assessment, and monitoring. EEC-5 also provides validated knowledge, models, processes and technologies to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Title: EEC-2, Maximize Training & Testing Requirements Within Environmental Constraints</p> <p align="right">Articles:</p> <p>FY 2024 Plans: -Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs of Navy training and test ranges to maximize the availability and utilization of the ranges. -Continue demonstration of Robust Caisson Structure to Reduce Blast Effects from Underwater Blow-In-Place. -Complete integrated analytical approach to transition from active to passive treatments at munitions sites.</p> <p>FY 2025 Base Plans: -Continue demonstration of Robust Caisson Structure to Reduce Blast Effects from Underwater Blow-In-Place.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement:</p>	0.311	0.357	0.250	0.000	0.250
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
FY25 decrease (\$0.107M) due to reduction in field work for demonstration of robust caisson structure to reduce blast effects from underwater Blow-In-Place.					
Title: EEC-3, Platform Maintenance and Repair With Minimal Environmental Footprint <p align="right">Articles:</p> <p>FY 2024 Plans: -Continue evaluations and demonstrations of innovative solutions for difficult and persistent aviation and shipyard platform sustainment issues related to hexavalent chrome, cadmium, volatile organic compounds (VOC) hazardous air pollutants. -Continue advanced anodize repair. -Continue Oxsol-Free and Low-VOC surface ship topside coatings for maintaining environmental regulations. -Complete development and implementation of methods to reduce sealant waste in Fleet/Depot level operations.</p> <p>FY 2025 Base Plans: -Continue advanced anodize repair. -Complete Oxsol-Free and Low-VOC surface ship topside coatings for maintaining environmental regulations.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease (\$0.260M) due to completion of development and implementation of methods to reduce sealant waste in Fleet/Depot level operations.</p>	1.490	1.606	1.346	0.000	1.346
	-	-	-	-	-
Title: EEC-4, Support Shore Readiness within Environmental Constraints <p align="right">Articles:</p> <p>FY 2024 Plans: -Continue evaluations and demonstrations of innovative solutions to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. -Continue Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME). -Continue Detection Methodology and Treatment Train Technology for PFAS Removal in Bilge and Oily Wastewater (BOW). -Continue Real-Time Multi-Contaminant Detection System (RMDS).</p>	1.510	1.699	1.305	0.000	1.305
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>-Complete Evaluation of Existing and Required Pier-side Infrastructure to Accommodate Shoreside Collection and Treatment of Navy Vessel Ballast Discharges.</p> <p>FY 2025 Base Plans: -Complete Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME), -Continue detection methodology and treatment train technology for PFAS removal in Bilge and Oily Wastewater (BOW). -Complete Real-Time Multi-Contaminant Detection System (RMDS).</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 decrease (\$0.394M) due to completion of complete characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME).</p>					
<p>Title: EEC-5, Cost-Effective Management of Environmental Regulatory Requirements</p> <p align="right">Articles:</p> <p>FY 2024 Plans: -Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations and management of coastal contamination and contaminated sediments. -Continue chronic toxicity and bioaccumulation evaluation of multiple PFAS for benthic and pelagic species relevant to marine ecological risk assessment; close loop (a processing system in which effluents are recycled, that is, treated and returned for reuse), in situ soil flushing (a minimally invasive technology that has historically been employed for subsurface remediation, allowing for sites to reach specified cleanup goals without excavation), at PFAS-Impacted source zones; sub-surface fate and transport of petroleum based contaminants in Naval Facilities; application of Supercritical Water Oxidation (SCWO) to destroy Per- and Polyfluoroalkyl Substance (PFAS)-impacted waste streams; Artificial Intelligence (AI) for environmental compliance; XCPC solar thermal evaporation for PFAS-Impacted wastewater minimization; 3D-printed cone spray ionization mass spectrometry for the rapid; low-cost and in-situ detection and mapping of PFAS in soil</p>	1.840	2.348	2.260	0.000	2.260
	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>-Complete an integrated Navy approach to estimate risk and cleanup goals for radionuclides associated with buildings at current and former Navy installations; pathways for addressing opportunistic premise plumbing pathogens.</p> <p>FY 2025 Base Plans:</p> <p>-Continue sub-surface fate and transport of petroleum based contaminants in Naval Facilities; application of Supercritical Water Oxidation (SCWO) to destroy Per- and Polyfluoroalkyl Substance (PFAS)-Impacted Waste Streams; AI for environmental compliance; XCPC solar thermal evaporation for PFAS-Impacted wastewater minimization.</p> <p>-Complete chronic toxicity and bioaccumulation evaluation of multiple PFAS for benthic and pelagic species relevant to marine ecological risk assessment; close loop, in situ soil flushing at PFAS-Impacted source zones; 3D-Printed cone spray ionization mass spectrometry for the rapid, low-cost and in-situ detection and mapping of PFAS in soil.</p> <p>FY 2025 OCO Plans: N/A</p> <p>FY 2024 to FY 2025 Increase/Decrease Statement: FY25 increase (\$0.088M) due to increased field and laboratory work on sub-surface fate and transport of petroleum based contaminants in Naval Facilities; and application of Supercritical Water Oxidation (SCWO) to destroy Per- and Polyfluoroalkyl Substance (PFAS)-impacted waste Streams.</p>					
Accomplishments/Planned Programs Subtotals	5.151	6.010	5.161	0.000	5.161

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

Remarks

D. Acquisition Strategy

This project is categorized as Non-ACAT (Non Acquisition). The project delivers a broad spectrum of products that require a variety of acquisition processes to implement. Equipment products for naval stations and other mission funded activities are often procured directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over \$350K are procured through their Capital Investment Program (CIP). For both types of activities, equipment products costing less than \$250K, and process changes not requiring the purchase of new equipment such as consumable material or product substitutions, are funded through the activity's operating budgets. Occasionally there is a technology that must be implemented as a specialized facility. These are acquired through the Military Construction (MILCON) Program. All these acquisition processes are pursued using a common strategy that satisfies the needs of all

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

the critical stakeholders: 1) fleet end user; 2) funding sponsor for the Navy end user; 3) other stakeholders with cognizance over the Navy process or operation being changed, 4) cognizant environmental federal, state, and local regulators; and 5) the private or government organization that will produce the product.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy												Date: March 2024			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection					Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)					
Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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
EEC 2	Various	EXWC : PT HUENEME, CA	8.268	0.311	Oct 2022	0.357	Oct 2023	0.250	Oct 2024	-		0.250	Continuing	Continuing	Continuing
EEC 2	Various	SSC : SAN DIEGO, CA	7.499	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
EEC 3	WR	NAWC : PATUXENT RIVER, MD	2.828	0.130	Mar 2023	0.130	Mar 2024	0.130	Mar 2025	-		0.130	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : BETHESDA, MD	4.789	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
EEC 3b	Various	EXWC : PT HUENEME, CA	1.928	0.160	Mar 2023	0.160	Mar 2024	0.160	Mar 2025	-		0.160	Continuing	Continuing	Continuing
EEC 4	Various	EXWC : PT HUENEME, CA	11.021	0.670	Mar 2023	0.680	Mar 2024	0.425	Mar 2025	-		0.425	Continuing	Continuing	Continuing
EEC 4	Various	NSWC : BETHESDA, MD	5.491	0.065	Nov 2022	0.100	Nov 2023	0.100	Nov 2024	-		0.100	Continuing	Continuing	Continuing
EEC 4a	Various	NIWC : SAN DIEGO, CA	6.048	0.775	Feb 2023	0.919	Feb 2024	0.780	Feb 2025	-		0.780	Continuing	Continuing	Continuing
EEC 5	Various	EXWC : PT HUENEME, CA	6.364	0.600	Oct 2022	0.830	Oct 2023	0.874	Oct 2024	-		0.874	Continuing	Continuing	Continuing
EEC 5	Various	NIWC : SAN DIEGO, CA	4.312	0.730	Oct 2022	1.005	Oct 2023	0.920	Oct 2024	-		0.920	Continuing	Continuing	Continuing
EEC 5	Various	NAWC : PATUXENT RIVER, MD	1.817	0.115	Jun 2023	0.115	Jun 2024	0.115	Oct 2024	-		0.115	Continuing	Continuing	Continuing
EEC 5	Various	NSWC : BETHESDA, MD	3.896	0.060	Jan 2023	0.061	Jan 2024	0.061	Jan 2025	-		0.061	Continuing	Continuing	Continuing
EEC 5	WR	NAWCWD : CHINA LAKE, CA	2.167	0.185	Dec 2022	0.187	Dec 2023	0.200	Dec 2024	-		0.200	Continuing	Continuing	Continuing
EEC 5	WR	NAWC : LAKE HURST, NJ	1.346	0.150	Nov 2022	0.150	Nov 2023	0.090	Nov 2024	-		0.090	Continuing	Continuing	Continuing
EEC 3	WR	FRC - SE : JACKSONVILLE, FL	3.985	0.635	May 2023	0.721	May 2024	0.661	May 2025	-		0.661	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : San Diego, CA	0.060	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>
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Product Development (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
EEC 3	WR	FRC - CE : Cherry Point, NC	0.815	0.100	Jun 2023	0.100	Jun 2024	0.000	Jun 2025	-		0.000	Continuing	Continuing	Continuing
EEC 3	Various	FRC-SW : San Diego, CA	1.616	0.195	Mar 2023	0.195	Mar 2024	0.195	Mar 2025	-		0.195	Continuing	Continuing	Continuing
EEC 3	WR	NRL : Washington DC	0.000	0.270	Feb 2023	0.300	Feb 2024	0.200	Feb 2025	-		0.200	Continuing	Continuing	Continuing
Subtotal			74.250	5.151		6.010		5.161		-		5.161	Continuing	Continuing	N/A

Remarks

Performing Activities: Naval Surface Warfare Center, Carderock Division (NSWC/CD); Engineering and Expeditionary Warfare Center (EXWC), Port Hueneme, CA; Naval Surface Warfare Center, Indian Head Division (NSWC/IH); Space and Warfare Systems Center, San Diego (SSC/SD); Naval Air Warfare Center Aircraft Division Patuxent River (NAWCAD/PAX); Naval Air Warfare Center (NAWCWD/China Lake); Naval Air Warfare Center Aircraft Division Lakehurst (NAWCAD/Lakehurst); Fleet Readiness Center Southeast, Jacksonville FL (FRC-SE); Fleet Readiness Center Southwest, San Diego (FRC-SW), Fleet Readiness Center East, Cherry Point (FRC-CE). Total Prior Years Cost: Subtotal does not include performing activities from prior years that are no longer performing activities. Award Dates: About 55% of the project is executed via contracts awarded by the performing activities. More rigorous contracting, funding, and performer work induction processes are slightly increasing project management costs. Projects are derived from field level needs and awarded competitively to performing organizations, the portfolio mix of cost category/performing organization naturally changes from fiscal year to fiscal year.

Explanation of increases/decreases greater than 2% between FY 2024 and FY 2025:

- EEC2 EXWC Port Hueneme decreased from \$0.357M to \$0.300M due to reduction in field work for continuing projects.
- EEC5 EXWC Port Hueneme CA increased from \$0.830M to \$0.869M due to an increase in field work for continuing projects.
- EEC5 NIWC San Diego CA increased from \$1.005M to \$1.070M due to increase in funds for program management support.
- EEC5 NAWCWD China Lake increased from \$0.187 to \$0.200M due to an increase in laboratory work for continuing projects.
- EEC5 NAWC Lakehurst decreased from \$0.150M to \$0.090M due to decrease in funds for program management support.

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	74.250	5.151	6.010	5.161	-	5.161	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
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

Proj 0817	
EEC 2	
EEC 3	
EEC 4	
EEC 5	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 0817</i>				
EEC 2	1	2023	4	2029
EEC 3	1	2023	4	2029
EEC 4	1	2023	4	2029
EEC 5	1	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy										Date: March 2024		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 9204 / <i>Marine Mammal Research</i>			
COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
9204: <i>Marine Mammal Research</i>	47.444	6.241	6.832	6.837	-	6.837	6.968	7.094	7.236	7.388	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Navy has been and will continue to be subject to litigation with regard to the potential injuring, killing or biologically significant disturbance of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable habitats, migration routes, or breeding areas of marine mammals and other protected marine species, the possibility exists that such incidents are likely to continue in the future. The increasing public interest and pressure has resulted in escalating Fleet costs. For example, Fleet and SYSCOM development activities have been interrupted; modified, or altogether cancelled and environmental regulations have, among other things, required new ship construction shock trials to obtain Federal permits and conduct extensive environmental planning that can take several years to complete. The incorporation of mitigation measures in Fleet training operations to minimize the potential adverse effects on protected marine animals can significantly reduce the realism of these operations. In addition, the testing, evaluation, and deployment of new sonar detection and monitoring systems that use active acoustics are under intense public scrutiny for their potential adverse effects on whales and other marine mammals. Navy needs scientific evidence to substantiate its claims of limited or inconsequential adverse effects to marine life from operations.

This project primarily focuses on the development of planning, monitoring, and mitigating tools to aid the Fleet in minimizing contact with and the potential harassment of protected marine animals during operations, exercises, training, and undersea surveillance and weapons testing. These new capabilities will encompass historical and newly acquired data and analytical models that together can predict marine animal habitats (where they are likely to be), and their natural and expected behavior (diving patterns, prey localization, calling activity, etc.). This project consists of three major areas that will help ensure Navy compliance with the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA).

These areas are (1) Marine Ecology and Population Dynamics - determine the likelihood of the presence of marine mammals or other protected species by developing habitat and ecological models. Refine marine animal survey techniques to optimize the accuracy of abundance estimates in small ocean regions of Navy interest. (2) Criteria, Thresholds, and Mitigation - Establish criteria and thresholds from which to measure potential impact on marine mammals and other marine species from Navy training operations. Determine the effectiveness and usefulness of various mitigation measures in relation to the potential impact of Navy operations on marine mammals; and (3) Mitigation Methodologies - Determine the observation, detection and classification measures required to develop effective monitoring and mitigation procedures for Fleet and SYSCOM use. Focus on improving marine animal monitoring capabilities over current methods by developing new technologies or improving existing technologies that improve monitoring and mitigation effectiveness, reduce cost and minimize impacts on readiness activities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Marine Ecology and Population Dynamics	1.134	1.384	1.384	0.000	1.384
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
<p>Description: Within the area of 'Marine Ecology and Population Dynamics', ongoing work covers topics such as density estimation from passive acoustic data, standards/metrics development and development of an automated sonar detector to standardize analysis of acoustic data.</p> <p>FY 2024 Plans: Ongoing studies that are expected to be completed by the end of FY 2024: -ACCURATE: ACoustic CUE RATEs for passive acoustic density estimation -Demonstration and validation of passive acoustic density estimation for right whales</p> <p>Ongoing studies that will continue into FY 2025: -Combining global OBS and CTBTO recordings to estimate abundance and density of fin and blue whales -RAVEN-X: Enhancing the efficiency of large-scale bioacoustic analyses -Cetacean Caller-ID [CETACID]: Validating approaches for identifying focal communication signals using acoustic recording tags -Climate change projects</p> <p>In addition, studies are expected to be initiated in FY2024 in response to needs collected from Navy personnel in FY 2023.</p> <p>FY 2025 Base Plans: Ongoing studies that are expected to be completed by the end of FY 2025: -Combining global OBS and CTBTO recordings to estimate abundance and density of fin and blue whales -Historic ARP and HARP Passive Acoustic Recording Archiving with NCEI</p> <p>Ongoing studies that will continue into FY 2026: -RAVEN-X: Enhancing the efficiency of large-scale bioacoustic analyses -Cetacean Caller-ID [CETACID]: Validating approaches for identifying focal communication signals using acoustic recording tags -Climate change projects</p> <p>In addition, studies are expected to be initiated in FY2025 in response to needs collected from Navy personnel in FY 2024.</p> <p>FY 2025 OCO Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
N/A					
FY 2024 to FY 2025 Increase/Decrease Statement: No change from FY24.					
Title: Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	4.050	4.233	4.233	0.000	4.233
Articles:	-	-	-	-	-
Description: Within the area of 'Criteria and Thresholds, Physiology and Behavior, and Effects of Sound', ongoing work covers topics such as hearing, temporary threshold shift, behavioral response studies, and effects from underwater explosions.					
FY 2024 Plans: Within the area of 'Criteria and Thresholds, Physiology and Behavior, and Effects of Sound', ongoing work covers topics such as hearing, temporary threshold shift, behavioral response studies, and effects from underwater explosions.					
Ongoing studies that are expected to be completed by the end of FY 2024: -Collection of auditory evoked potential hearing thresholds in minke whales (<i>Balaenoptera acutorostrata</i>) data on sea turtle hearing/TTS -Towards a mysticete audiogram using humpback whales' behavioral response thresholds data on mysticete hearing -Standardizing auditory evoked potential hearing thresholds with behavioral hearing thresholds -Loudness perception in killer whales (<i>Orcinus orca</i>); effects of temporal and frequency summation -Minimum sound pressure levels required for TTS during simulated continuously active sonar -Dolphin conditioned hearing attenuation					
Ongoing studies that will continue into FY 2024: -3S4: Effects of continuous active sonar and longer duration sonar exposures -Behavioral response to SURTASS LFA sonar -Effect of signal duration on perceived loudness in bottlenose dolphins and California sea lions					
In addition, studies are expected to be initiated in FY 2024 in response to needs collected from Navy personnel in FY 2023.					
FY 2025 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
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Within the area of 'Criteria and Thresholds, Physiology and Behavior, and Effects of Sound', ongoing work covers topics such as hearing, temporary threshold shift, behavioral response studies, and effects from underwater explosions.

No studies are scheduled to be completed in FY 2025.

Ongoing studies that will continue into FY 2026:

- 3S4: Effects of continuous active sonar and longer duration sonar exposures
- Behavioral response to SURTASS LFA sonar
- Effect of signal duration on perceived loudness in bottlenose dolphins and California sea lions
- Measuring behavioral responses of Cuvier's beaked whales to continuously active sonar

In addition, studies are expected to be initiated in FY 2025 in response to needs collected from Navy personnel in FY 2024

FY 2025 OCO Plans:

N/A

FY 2024 to FY 2025 Increase/Decrease Statement:

No change from FY24.

Title: Mitigation Methodologies: Monitoring, New Technology, and Risk Assess	1.057	1.215	1.220	0.000	1.220
Articles:	-	-	-	-	-

Description: Within the area of 'Mitigation Methodologies', ongoing work covers demonstration and validation of new technologies for monitoring and mitigation.

FY 2024 Plans:

Within the area of 'Mitigation Methodologies', ongoing work covers demonstration and validation of new technologies for monitoring and mitigation.

Ongoing studies that are expected to be completed by the end of FY 2024:

- Improve Tag Attachment System for Remotely-Deployed Medium-Term Cetacean Tags
- Demonstrating suction-cup tag systems to support behavioral response studies (BRS)

Ongoing studies that will continue into FY 2025:

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
-M3R (Marine Mammal Monitoring on Navy Ranges) -Integration and field evaluation of the next generation high-fidelity sound and movement tags to investigate behavioral response <i>FY 2025 Base Plans:</i> Within the area of 'Mitigation Methodologies', ongoing work covers demonstration and validation of new technologies for monitoring and mitigation. Ongoing studies that are expected to be completed by the end of FY 2025: -Integration and field evaluation of the next generation high-fidelity sound and movement tags to investigate behavioral response Ongoing studies that will continue into FY 2026: -M3R (Marine Mammal Monitoring on Navy Ranges) -Thermal imaging for vessel strike mitigation on autonomous vessels <i>FY 2025 OCO Plans:</i> N/A <i>FY 2024 to FY 2025 Increase/Decrease Statement:</i> FY25 increase (\$0.005M) to support ongoing projects getting finalized.					
Accomplishments/Planned Programs Subtotals	6.241	6.832	6.837	0.000	6.837

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

N/A

Remarks

D. Acquisition Strategy

RDTEN Contracts are Competitive Procurements.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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Test and Evaluation (\$ in Millions)				FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 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			
Developmental Test & Evaluation (DT&E)	Various	EXWC CA : Port Hueneme, CA	6.324	1.005	Oct 2022	1.255	Oct 2023	1.260	Oct 2024	-		1.260	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	SPAWAR CA : San Diego, CA	1.773	0.204	Oct 2022	0.208	Nov 2023	0.208	Nov 2024	-		0.208	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	MARECOTEL : Seabeck, WA	2.960	0.400	Oct 2022	0.000		0.000		-		0.000	0.000	3.360	-
Developmental Test & Evaluation (DT&E)	Various	EXWC PH : Port Hueneme, CA	6.754	3.039	Jan 2023	3.585	Oct 2023	3.585	Oct 2024	-		3.585	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAVAIR : Lakehurst, NJ	0.807	0.075	Oct 2022	0.075	Nov 2023	0.075	Nov 2024	-		0.075	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	EXWC : Port Hueneme, CA	2.842	0.570	Oct 2022	0.742	Oct 2023	0.742	Oct 2024	-		0.742	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC RI : Newport, RI	12.151	0.306	Oct 2022	0.312	Nov 2023	0.312	Nov 2024	-		0.312	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NPGS : Monterey, CA	3.729	0.030	Oct 2022	0.031	Nov 2023	0.031	Nov 2024	-		0.031	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	NOAA: Various : La Jolla, CA	3.711	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC : Newport, RI	1.000	0.306	Oct 2022	0.312	Nov 2023	0.312	Nov 2024	-		0.312	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	SPAWAR : San Diego, CA	5.393	0.306	Oct 2022	0.312	Nov 2023	0.312	Nov 2024	-		0.312	Continuing	Continuing	Continuing
Subtotal			47.444	6.241		6.832		6.837		-		6.837	Continuing	Continuing	N/A

Remarks
Individual projects are derived from field level needs and awarded competitively to performing organizations, the portfolio mix of cost category/performing organization naturally changes from fiscal year to fiscal year. Increase due to planned FY 2023/2024 projects that will be awarded competitively by EXWC to performing organizations based on subject matter expertise required by Navy need.

	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	47.444	6.241	6.832	6.837	-	6.837	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Navy	Date: March 2024
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>									
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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
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>MARINE MAMMAL RESEARCH</i>	
Marine Mammal Ecology and Population Dynamics	
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>MARINE MAMMAL RESEARCH</i>				
Marine Mammal Ecology and Population Dynamics	1	2023	4	2029
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1	2023	4	2029
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1	2023	4	2029

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy **Date:** March 2024

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9210 / <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
9210: <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>	0.000	2.307	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.307
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Navy has been and will continue to be subject to scrutiny over Red Hill storage tanks and the fuel leaks associated with them. The increasing public interest and pressure to clean up the leaked fuel and decommission the tanks has resulted in the need to develop new technologies for tank cleanup and community relations projects promoting water resilience.

The primary focus areas addressing the Red Hill tank fuel leaks are: (1) Water Resilience - investigate and demonstrate enhanced water resiliency technologies. (2) Hydrogeology - oversee the development of an independent and representative hydrogeologic model. (3) Innovation Initiatives - implement innovation challenges and Capstone student project based on problem statements relating to the Red Hill tanks. (4) Tank Cleaning Verification Technologies - oversee the demonstrate of ultraviolet Fluorescence to verify the cleaning of the Red Hill tanks.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Title: Red Hill Bulk Fuel Storage	2.307	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2024 Plans: N/A					
FY 2025 Base Plans: N/A					
FY 2025 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	2.307	0.000	0.000	0.000	0.000

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9210 / <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>

D. Acquisition Strategy

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2025 Navy										Date: March 2024			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 9210 / <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>				

Proj 9210	FY 2023				FY 2024				FY 2025			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Red Hill Bulk Fuel Storage												

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Exhibit R-4A, RDT&E Schedule Details: PB 2025 Navy		Date: March 2024
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9210 / <i>Red Hill Bulk Fuel Storage Facility (RHBFSF)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9210				
Red Hill Bulk Fuel Storage: Red Hill Bulk Fuel Storage	1	2023	4	2023