Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy											Date: February 2016	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603721N *I Environmental Protection*							
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
Total Program Element	409.800	13.200	19.289	20.343	-	20.343	20.951	20.974	21.131	21.561	Continuing	Continuing
0401: *Shipboard Waste Mgmt*	337.163	5.612	8.393	8.195	-	8.195	8.807	8.864	8.894	9.083	Continuing	Continuing
0817: *Environmental Sustainability Development (NESDI)*	35.036	3.712	5.604	6.822	-	6.822	6.554	6.648	6.887	7.023	Continuing	Continuing
9204: *Marine Mammal Research*	37.601	3.876	5.292	5.326	-	5.326	5.590	5.462	5.350	5.455	Continuing	Continuing

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 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 (MARPOL 73/78), (d) DoD 4715.6 R1, Regulations on Vessels Owned or Operated by the Department of Defense, (e) OPNAV M-5090.1, Environmental and Natural Resources Program Manual,(f) 40 CFR Part 9 and Chapter VII (Uniform National Discharge Standards [UNDS] Phase I Standard), (EO) 13148, Greening the Government Through Leadership in Environmental Management, (g) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, (h) National Invasive Species Act of 1996, (i) 33 CFR 151 Subpart D-Ballast Water Management for Control of Nonindigenous Species in Waters of the United States, (j) Clean Air Act, (k) Federal Insecticide, Fungicide, and Rodenticide Act, (l) Marine Mammal Protection Act, and (m) Endangered Species Act. References (a) through (m) establish Level I environmental protection requirements. Project 0401 supports RDT&E efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Liquid Wastes, (2) UNDS Rulemaking, (3) Hazardous Materials and Pollution Prevention, (4) Hull Antifouling Paints, (5) Technical Authority, and (6) Ballast Water Exchange Improvements. Project 0817 supports RDT&E to develop and validate technologies to enable Navy facilities to comply with environmental laws, regulations, and policies in a cost-effective manner.

The 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. The RDT&E efforts funded under the MMR program allow the Navy to avoid or reduce the chances of costly litigation for non-compliance.

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy	Date: February 2016
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0603721N *I Environmental Protection*

B. Program Change Summary ($ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	13.200	20.711	20.541	-	20.541
Current President's Budget	13.200	19.289	20.343	-	20.343
Total Adjustments	0.000	-1.422	-0.198	-	-0.198
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-1.422			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	0.000	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.198	-	-0.198

Change Summary Explanation

FY 2017 decrease in Environmental Protection RDTEN by $0.842M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

The FY 2017 funding request was also reduced by $0.466 million to account for the availability of prior year execution balances.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0401 / *Shipboard Waste Mgmt*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0401: *Shipboard Waste Mgmt*	337.163	5.612	8.393	8.195	-	8.195	8.807	8.864	8.894	9.083	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Navy ships and submarines must routinely operate in U.S., international, and foreign waters, and visit numerous U.S. and foreign ports. No body of water is without environmental restrictions that impact the movements and operations of Navy vessels. Environmental requirements tend to be most restrictive in port and in coastal waters, where the Navy's increasing littoral presence places ships and submarines in discharge-restricted waters for longer periods of time. Growing international cooperation in addressing global environmental concerns is resulting in expanding areas of ocean considered environmentally susceptible, where special prohibitions on ship discharges and operations are imposed. Navy vessels must comply with applicable environmental legal requirements while maintaining continued access to all waters for operations, exercises, training, and port access. The large crews and limited on-board space of Navy ships and submarines severely constrain their ability to hold wastes for return to port for shore side disposal.

The Shipboard Waste Management RDT&E project evaluates and develops shipboard environmental equipment, systems, technologies, processes, and practices to comply with environmental laws, regulations, Executive Orders, international agreements, foreign-country requirements, and DoD and Navy policies. The project focuses on providing engineering criteria, design guidance, and performance specifications for selecting, procuring, installing, integrating, and operating environmental equipment and systems on Navy ships and submarines, and on defining and developing processes, procedures and logistics support requirements. Environmental equipment, systems, processes and practices must meet legal and environmental requirements and be reliable, maintainable and achievable at sea, and impose no or low manning burden. Environmental equipment and systems must meet Navy-unique shipboard requirements (performance, space, weight, shock, vibration, electromagnetic compatibility, manning, automation, etc.), incorporate integrated logistics support, minimize life-cycle cost, and include validated acquisition, design, installation, and operating documentation. Shipboard processes and practices must be feasible and must be compatible with ship and submarine operational, maintenance, manning, habitability, health, and safety requirements. It also addresses afloat environmental issues other than shipboard wastes, e.g., access to environmental data for planning Fleet operations and exercises.

The Afloat Environmental Quality Program supports the designated Technical Warrant Holder 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.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Technical Authority	1.200	3.087	2.587	0.000	2.587
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- In FY15 and prior, Non-Copper Antifouling and Solid Waste are addressed under the Technical Authority Program. Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum separates Non-Copper Antifouling and Solid Waste from the Technical Authority Program. - Identified, acquired, and evaluated various commercial off-the-shelf compacting equipment to understand the effectiveness of reducing waste volume for storage at sea to comply with the Act to Prevent Pollution from Ships (APPS) - Developed test plan for logging system to assess the effectiveness of recording exchanges - Performed technology assessment of treatment systems for Navy shipboard application - Met with the North Atlantic Treaty Organization (NATO) and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - Performed ship design studies on the impact of the integration of engine emission treatment systems on future ship design - Worked 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 Non-Copper Antifouling: - Executed panel test of an antifouling coating of high interest to SEA05P2 - Integrated effort into on-going Office of Naval Research (ONR) Inter-site Calibration Study - Prepared, exposed, and inspected panels quarterly Solid Waste: - Performed extensive, full scale, long-term endurance laboratory testing of shipboard solid waste management equipment for compactor, baler, and densifier, evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship and submarine environmental capabilities. - Developed waste stream management plans for tested equipment in support of the Act to Prevent Pollution from Ships, which invokes the requirements of MARPOL, Annex V - Completed metal Alternative Trash Compactor Unit can testing and update design based on fleet input - Continued development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols ***FY 2016 Plans:*** - Perform assessments of emergent commercial off the shelf oil spill and air emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Identify systems that are worthy of detailed acquisition and evaluation - Perform design studies of rapid ballast water tank treatment technologies - Prepare Design Practice Criteria manuals for both APPS compliant solid waste management systems as well as ballast water treatment system - Review emergent ship spills and other discharge violations - Identify opportunities to reduce the risk of future violations - Meet with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - 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 development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols					
FY 2017 Base Plans: - Perform assessments of emergent commercial off the shelf oil spill and air emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations - Identify systems that are worthy of detailed acquisition and evaluation - Perform design studies of rapid ballast water tank treatment technologies - Prepare Design Practice Criteria manuals for both APPS compliant solid waste management systems as well as ballast water treatment system - Review emergent ship spills and other discharge violations - Identify opportunities to reduce the risk of future violations - Meet with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance - 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 development of environmental equipment/system requirements documentation, design criteria/ guidance, specification standards, and certification protocols					
FY 2017 OCO Plans: N/A					
Title: Liquid Wastes	2.000	2.122	2.050	0.000	2.050
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Oil Pollution Abatement: - Investigated commercial Marine Pollution Control Devices (MPCD) for affordability initiatives supporting LHA-8 - Initiated shipboard evaluation of LCS oil water separator Non-Oily Waste: - Conducted a market survey of commercial marine sanitation devices and peripheral support equipment - Installed commercial biological marine sanitation device for laboratory evaluation and conducted pre-test - Leveraged Army land-based testing to evaluate two sewage treatment technologies for marine application Uniformed National Discharge Standards (UNDS): - Supported Endangered Species Act Consultation for UNDS Batch One, Phase II - Prepared Navy UNDS Implementation Plan for 11 UNDS Batch One, Phase II discharge - Drafted MPCD performance standards for 14 UNDS Batch Two, Phase II Discharges - Beginning in FY16, UNDS efforts are funded by O&MN					
FY 2016 Plans: Oil Pollution Abatement: - Purchase and evaluate commercial MPCDs for affordability initiatives supporting LHA-8 - Finalize shipboard evaluation of LCS oil water separator - Initiate testing of automated oil water separator for LSD life extension Non-Oily Waste: - Develop procurement specification for marine sanitation devices - Complete laboratory testing of commercial biological marine sanitation device - Test grease pretreatment components to support procurement specification development					
FY 2017 Base Plans: Oil Pollution Abatement: - Complete testing of MPCDs for affordability initiatives supporting LHA-8 - Complete testing of automated oil water separator for LSD life extension - Investigate commercial oil content monitors for potential new discharge standard Non-Oily Waste: - Publish procurement specification for marine sanitation devices					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Acquire marine sanitation device materials to validate marine sanitation device procurement specification ***FY 2017 OCO Plans:*** N/A					
Title: Hazardous Material Control and Management	1.200	1.061	1.016	0.000	1.016
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Researched, tested and evaluated less hazardous or non-hazardous substitutes for high-risk hazardous materials - Tested newly developed paint mixer in shipboard setting - Investigated common cleaner dispenser(s) - Completed placard template for deep sinks where emulsions could occur and link to appropriate documentation - Published hazardous material Engineering Technical Authority Procedure (ETAP) ***FY 2016 Plans:*** - Expand ETAP to include link to health hazard assessments - Research, test, and evaluate less hazardous or non-hazardous substitutes for high-risk hazardous materials - Continue shipboard evaluation of new paint mixer - Down select and test cleaner dispenser(s) shipboard ***FY 2017 Base Plans:*** - Research, test, and evaluate less hazardous or non-hazardous substitutes for high-risk hazardous materials - Continue test and evaluation of pollution-prevention equipment aboard surface ships and submarines ***FY 2017 OCO Plans:*** N/A					
Title: Ballast Water Management	1.212	0.965	1.368	0.000	1.368
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - Installed a ballast water exchange logging system on a test platform to assist the ships with ballast water exchange procedures and recordkeeping to comply with OPNAV M-5090.1 Environmental Readiness Program. - Conducted studies on design options to integrate a treatment system on future ship designs					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Investigated commercially approved ballast water treatment systems and other design options to allow for treatment to meet future ballast water discharge requirements, and testing facility protocols to develop recommendations for NAVSEA system approval requirements ***FY 2016 Plans:*** - Initiate new efforts to conduct research evaluating ballast water treatment hardware/systems in preparation for anticipated ballast water standards in joint EPA/DoD negotiated Uniform National Discharge Standards (UNDS) Batch 2 - Evaluate the procurement of a ballast water treatment system to determine suitability for shipboard use. - Continue development of NAVSEA requirements for ship integration and begin efforts to procure treatment systems to test suitability and operability for ship integration ***FY 2017 Base Plans:*** - Perform full scale evaluation of a commercial ballast water treatment system for verification of suitability as a shipboard system - Continue to develop shipboard procedural documents and design guidance for meeting ballast water discharge standards requirements and continue to investigate commercial and design options to comply with discharge standards requirements ***FY 2017 OCO Plans:*** N/A					
Title: Solid Waste Management	0.000	0.965	0.978	0.000	0.978
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - In FY15 and prior, Solid Waste is addressed under the Technical Authority Program ***FY 2016 Plans:*** - Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum segregates Solid Waste from the Technical Authority Program - Perform extensive full scale laboratory long term endurance testing of shipboard solid waste management equipment for waste converter evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship and submarine environmental capabilities					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate extensive full scale laboratory long term endurance testing of shipboard solid waste incinerator, evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship environmental capabilities ***FY 2017 Base Plans:*** - Complete extensive full scale laboratory long term endurance testing of shipboard solid waste management equipment for incinerator evaluating effectiveness and reliability of equipment to facilitate execution of technical authority for ship environmental capabilities ***FY 2017 OCO Plans:*** N/A					
Title: Non-Copper Antifouling	0.000	0.193	0.196	0.000	0.196
Articles:	-	-	-	-	-
FY 2015 Accomplishments: - In FY15 and prior, Non-Copper Antifouling is addressed under the Technical Authority Program ***FY 2016 Plans:*** - Beginning in FY16, the Shipboard Waste Management Program Objective Memorandum segregates Non-Copper Antifouling from the Technical Authority Program - Identify advanced antifouling coating systems - Prepare samples and execute release rate testing under contract and in accordance with standard/ASTM test methods - Compare results to release rates associated with legacy, qualified coating systems (copper ablative coatings) - Identify coatings with copper release rates equal to or lower than legacy systems - Prepare final report with recommendations for follow-on testing ***FY 2017 Base Plans:*** - Evaluate NAVSEA screening and qualification test requirements for fouling release (with and without biocides) and antifouling coatings - Identify gaps; develop and execute testing to fill gaps - Compare results from historical qualification tests with full scale data plus Office of Naval Research (ONR) Intersite Calibration Study and Fouling Release Coating Study data - Prepare final report with recommendations					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Draft qualification procedure modifications as needed ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.612	8.393	8.195	0.000	8.195

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0401 / *Shipboard Waste Mgmt*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	US Army Corps of Engineers : Norfolk, VA	0.687	0.000		0.000		0.000		-		0.000	0.000	0.687	-
Developmental Test & Evaluation	C/CPFF	NSWCCD, Bethesda, MD : Bethesda, MD	194.895	5.392	Nov 2014	8.145	Nov 2015	7.940	Nov 2016	-		7.940	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWCIHD : Indian Head, MD	1.086	0.000		0.000		0.000		-		0.000	0.000	1.086	-
Developmental Test & Evaluation	WR	NRL,Wash,DC : Wash,DC	30.876	0.220	Nov 2014	0.248	Nov 2015	0.255	Nov 2016	-		0.255	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SPAWARSYSCEN : SD,CA	12.308	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0401 / *Shipboard Waste Mgmt*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Misc. Govt Labs : TBD	22.975	0.000		0.000		0.000		-		0.000	0.000	22.975	-
Developmental Test & Evaluation	C/CPFF	SAIC : San Diego, CA	15.570	0.000		0.000		0.000		-		0.000	0.000	15.570	-
Developmental Test & Evaluation	C/CPFF	Misc. Contracts : TBD	13.103	0.000		0.000		0.000		-		0.000	0.000	13.103	-
Process Control Engineering	C/CPFF	M. Rosenblatt & Sons : Arlington, VA	6.547	0.000		0.000		0.000		-		0.000	0.000	6.547	Continuing
Developmental Test & Evaluation	C/CPFF	ONR : Arlington, VA	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	Continuing
Developmental Test & Evaluation	WR	Naval Postgraduate School : Monterey, CA	1.800	0.000		0.000		0.000		-		0.000	0.000	1.800	Continuing
Process Control Engineering	MIPR	EPA, Hdqtrs : Washington, DC	0.840	0.000		0.000		0.000		-		0.000	0.000	0.840	Continuing
		Subtotal	301.087	5.612		8.393		8.195		-		8.195	-	-	-

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington, DC	0.375	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SBIR Assessment	TBD	Not Specified : Not Specified	0.227	0.000		0.000		0.000		-		0.000	0.000	0.227	Continuing
		Subtotal	0.602	0.000		0.000		0.000		-		0.000	-	-	-

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	337.163	5.612		8.393		8.195		-		8.195	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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																												
Non-Copper Antifouling																												

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0401 / *Shipboard Waste Mgmt*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SHIPBOARD WASTE MANAGEMENT				
Technical Authority	1	2015	4	2021
Liquid Wastes	1	2015	4	2021
Hazardous Material Control and Management	1	2015	4	2021
Ballast Water Management	1	2015	4	2021
Solid Waste Management	1	2015	4	2021
Non-Copper Antifouling	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 0817 / *Environmental Sustainability Development (NESDI)*	

COST ($ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
0817: *Environmental Sustainability Development (NESDI)*	35.036	3.712	5.604	6.822	-	6.822	6.554	6.648	6.887	7.023	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Inherent to the realization of the vision outlined in Sea Power 21 are certain environmental consequences that will, to a lesser or greater degree, be an impact on the Navy's ability to fully achieve the strategy outlined in the Navy Capability Pillars (NCP) SEA SHIELD, SEA STRIKE, SEA BASING and FORCEnet and the supporting initiatives of SEA WARRIOR, SEA TRIAL and SEA ENTERPRISE. Readiness and training are primary considerations for determining whether any fighting force is at its peak proficiency. The ability to train our forces in a realistic environment is paramount. 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 Sea Power 21, the Navy must anticipate potential environmental regulations which, while not currently an issue, 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.

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.

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 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.

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.

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 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Maximize Training & Testing Requirements Within Environmental Constraints	0.590	0.719	1.334	0.000	1.334
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided and validated knowledge, models, and processes to mitigate environmental impacts restrictions' and costs of Navy training test ranges to maximize the availability and utilization of the ranges. Started multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites.					
FY 2016 Plans: FY16 funding will be applied to: - Provide funding for the 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- New tasks for multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites, which will be extended into and funded in FY17. ***FY 2017 Base Plans:*** FY17 funds support 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. - Increase in funding will support new/continuation of tasks related to multi-spectral weapon impact detection system and underwater low environmental impact munitions breaching technology to better characterize environmental impacts of munitions on training ranges and munitions response sites. - Continue x-ray inspection system to demilitarize targets and analysis of the long-term fate of munitions constituents from unexploded ordnance. ***FY 2017 OCO Plans:*** N/A					
Title: Platform Maintenance and Repair With Minimal Environmental Footprint	0.725	1.263	1.376	0.000	1.376
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided aviation sustainment projects related to chrome alternatives and cadmium reductions, continue the elimination of overspray in shipbuilding and facilities maintenance operations. Started investigation of improved epi-seal materials for use in general purpose bombs and trivalent chromium conversion coating enhanced coloration of aluminum substrates. Continued investigation of low volatile organic compound and low hazardous air pollutant wipe solvent and paint thinner validation, mobile pier facility wastewater treatment system and advanced non-chromate primers and coatings. ***FY 2016 Plans:*** FY16 funding will be applied to the substantial backlog to: - Continue all aviation sustainment projects related to chrome alternatives and cadmium reductions, and the elimination of overspray in shipbuilding and facilities maintenance operations and projects on trivalent chromium conversion coating-enhanced coloration of aluminum substrates. - Start new tasks for the projects mobile pier facility waste water treatment system and advanced nonchromate primers and coatings.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- Initiate cadmium and chromium elimination and aqueous cleaning projects. ***FY 2017 Base Plans:*** Continue all aviation sustainment projects related to chrome alternatives and cadmium reductions, continue the elimination of overspray in shipbuilding and facilities maintenance operations. Continue low volatile organic compound, low hazardous air pollutant wipe solvent and paint thinner validation, trivalent chromium conversion coating enhanced coloration of aluminum substrates, non-isocyanate polyurethane free formulation for aircraft and support equipment, and multi-functional surface preparation technology for maintenance painting in shipyards. ***FY 2017 OCO Plans:*** N/A					
Title: Support Shore Readiness within Environmental Constraints	0.995	1.939	1.833	0.000	1.833
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Provided systems and processes to minimize regulated emissions, and discharged hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continued oil boom biofouling control, dry dock sediment management, biofouling reduction of ship cooling water systems. Started closed-loop cooling water system to accommodate ship cooling water needs and evaluation of compliance options for Clean Water Act permits for cooling water intake structures. ***FY 2016 Plans:*** - Continue providing systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue oil boom fouling control. - Start dry dock sediment management, treatment of ship heavy metal contaminated oily waste and the evaluation of compliance options for NPDES permits for cooling water intake structures. ***FY 2017 Base Plans:*** Continue providing systems and processes to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations. Continue biofouling reduction of ship cooling water systems, closed-loop cooling water system to accommodate ship cooling water needs, evaluation of compliance options for Clean Water Act permits for cooling water intake structures, optimization of ship to shore regulated garbage management, improved dewatering of dredge					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
sediment, diverless deployment system for in-situ sediment samplers, and quantification of Polychlorinated Biphenyl (PCB) paint volatilization from ship cutting operations. ***FY 2017 OCO Plans:*** N/A					
Title: Cost-Effective Management of Environmental Regulatory Requirements	1.402	1.683	2.279	0.000	2.279
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Continued providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduced the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. Continued emissions capture and measurement technology for oxy-fuel hull cutting operations, low impact development demonstrations, and aerobic bioaugmentation for remediation of research department explosive (RDX) contaminated groundwater. Started pierside in-situ discharge monitoring for collection and holding tank contaminants, improved method for quantifying algal biomass to meet nutrient compliance.					
FY 2016 Plans: FY16 funding will be applied to: - Continued provision of validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments. - Tasks for sustainable remediation of low pH aquifers and aquifers with a continuing contaminant source using proton reduction technology, aerobic bio-augmentation for remediation of RDX contaminated groundwater, reduce the cost of compliance with coastal contamination and contaminated sediment and demonstration of improved method for quantifying algae biomass to meet nutrient numeric endpoint permit compliance. - Initiate projects for coral reef assessment technology, vapor intrusion prevention and improved treatment of contaminated storm-water.					
FY 2017 Base Plans: FY17 funds support validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
- In compliance with environmental policy and regulations, funding supports storm-water sampling and treatment demonstrations, perfluorochemicals from DoD sites conceptual site model development, autonomous benthic ecology monitoring system, and management tools for radiological compounds in environmental media. - Provide funding for coral reef assessment technology project, vapor intrusion prevention and improved treatment of contaminated storm-water. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.712	5.604	6.822	0.000	6.822

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 $250K 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 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.

E. Performance Metrics

Quarterly Budget Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 2	Various	EXWC : PT HUENEME, CA	4.700	0.490	Oct 2014	0.395	Jun 2016	0.902	Oct 2016	-		0.902	Continuing	Continuing	Continuing
EEC 2	Various	SSC : SAN DIEGO, CA	5.125	0.100	Oct 2014	0.324	Mar 2016	0.432	Oct 2016	-		0.432	Continuing	Continuing	Continuing
EEC 3	WR	NAWC : PATUXENT RIVER, MD	1.581	0.100	Oct 2014	0.235	Apr 2016	0.212	Jul 2017	-		0.212	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : BETHESDA, MD	3.334	0.100	Oct 2014	0.196	Feb 2016	0.264	May 2017	-		0.264	Continuing	Continuing	Continuing
EEC 3b	Various	EXWC : PT HUENEME, CA	1.257	0.000		0.050	Jun 2016	0.128	May 2017	-		0.128	Continuing	Continuing	Continuing
EEC 4	Various	EXWC : PT HUENEME, CA	6.231	0.400	Dec 2014	1.149	Oct 2015	0.733	Mar 2017	-		0.733	Continuing	Continuing	Continuing
EEC 4	Various	NSWC : BETHESDA, MD	2.708	0.500	Dec 2014	0.605	Mar 2016	0.700	Oct 2016	-		0.700	Continuing	Continuing	Continuing
EEC 4a	Various	SSC : SAN DIEGO, CA	2.950	0.100	Dec 2014	0.185	Apr 2016	0.400	Jan 2017	-		0.400	Continuing	Continuing	Continuing
EEC 5	Various	EXWC : PT HUENEME, CA	2.029	0.450	Nov 2014	0.507	Mar 2016	0.720	Jan 2017	-		0.720	Continuing	Continuing	Continuing
EEC 5	Various	SSC : SAN DIEGO, CA	0.705	0.425	Nov 2014	0.410	Oct 2015	0.330	Feb 2017	-		0.330	Continuing	Continuing	Continuing
EEC 5	Various	NAWC : PATUXENT RIVER, MD	1.042	0.000		0.145	May 2016	0.172	Jun 2017	-		0.172	Continuing	Continuing	Continuing
EEC 5	Various	NSWC : BETHESDA, MD	0.933	0.322	Feb 2015	0.495	Oct 2015	0.655	Jan 2017	-		0.655	Continuing	Continuing	Continuing
EEC 5	WR	NAWCWD : CHINA LAKE, CA	0.994	0.075	Nov 2014	0.076	Feb 2016	0.262	Oct 2016	-		0.262	Continuing	Continuing	Continuing
EEC 5	WR	NAWC : LAKE HURST, NJ	0.616	0.050	Nov 2014	0.050	Apr 2016	0.140	Nov 2016	-		0.140	Continuing	Continuing	Continuing
EEC 3	WR	FRC - SE : JACKSONVILLE, FL	0.470	0.400	Oct 2014	0.435	Mar 2016	0.460	Feb 2017	-		0.460	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : San Diego, CA	0.000	0.000		0.000	Mar 2016	0.075	Jun 2017	-		0.075	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy		Date: February 2016
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 3	WR	FRC - CE : Cherry Point, NC	0.145	0.100	Nov 2014	0.075	Mar 2016	0.075	Jun 2017	-		0.075	Continuing	Continuing	Continuing
EEC 3	Various	FRC-SW : San Diego, CA	0.216	0.100	Oct 2014	0.272	Oct 2015	0.162	Mar 2017	-		0.162	Continuing	Continuing	Continuing
		Subtotal	35.036	3.712		5.604		6.822		-		6.822	-	-	-

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.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	35.036	3.712		5.604		6.822		-		6.822	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

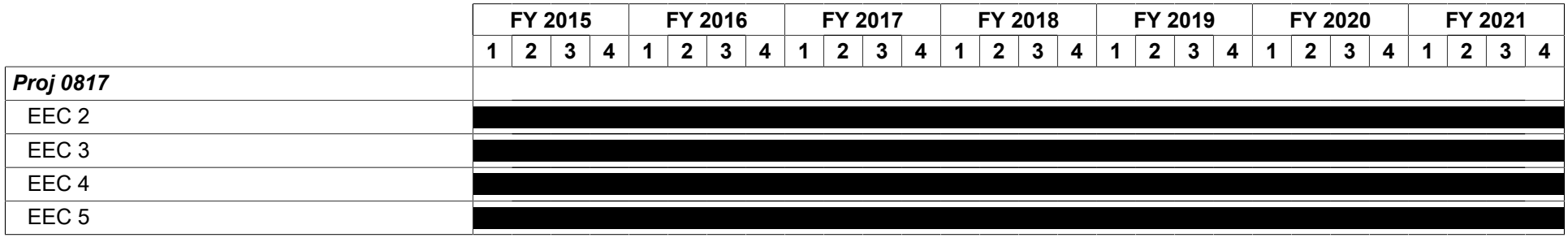

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 0817 / *Environmental Sustainability Development (NESDI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0817				
EEC 2	1	2015	4	2021
EEC 3	1	2015	4	2021
EEC 4	1	2015	4	2021
EEC 5	1	2015	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy									Date: February 2016			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*				Project (Number/Name) 9204 / *Marine Mammal Research*			
COST ($ in Millions)	**Prior Years**	**FY 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**Cost To Complete**	**Total Cost**
9204: *Marine Mammal Research*	37.601	3.876	5.292	5.326	-	5.326	5.590	5.462	5.350	5.455	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 2015**	**FY 2016**	**FY 2017 Base**	**FY 2017 OCO**	**FY 2017 Total**
Title: Marine Ecology and Population Dynamics	0.735	0.707	0.871	0.000	0.871
Articles:	-	-	-	-	-
FY 2015 Accomplishments:					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
The MMR program continued research on the ecosystem status and habitat use by marine species of Navy interest, with a priority emphasis on the population structure of beaked whales and other sound sensitive species in the vicinity of Navy training ranges. This included the development and testing of new sensors such as, acoustic listening devices and tags that provide the scientists with tools to study these animals as well as work with the Navy Marine Species Densitydata program, to develop data standards and data management standards consistent with the best standards of the expert community which was closed out in FY15. As a result of the budget reduction in FY15, funding levels were reduced in the other two topics to preserve the level of funding in this topic. The reduction in FY15 funding caused delays in the projects funded under the Criteria and Thresholds, Physiology and Behavior, and Effects of Sound and Mitigation Methodologies: Monitoring, New Technology, and Risk Assess topics. Also, due to limited funding, several new starts were delayed in FY15 to FY17. The delay in the projects and tools in development, resulted in increased costs to the legally required Fleet and SYSCOM's monitoring programs because they had to use more costly methods.					
FY 2016 Plans: Continue research on ecosystems status and habitat use by marine species of Navy interest; sensor and tag development; with a priority emphasis on the population structure of beaked whales in the vicinity of Navy training ranges. Work with the Navy Marine Species Density data program to develop tools and methods to improve the abundance estimates and density distribution data, consistent with the best standards of the expert community.					
FY 2017 Base Plans: Funding within this topic area will increase slightly in FY17 to continue research on the ecology and habitat of marine species of Navy interest, with a priority emphasis on the population structure of beaked whales and other sound sensitive species in the vicinity of Navy training ranges. Continue to develop tools and methods to improve the abundance estimates and density distribution data including passive acoustic based density estimates, consistent with the best standards of the expert community. Two additional projects that were delayed in FY15 and FY16 will allow the development of new tools to assess the population size and study marine mammal habitat necessary for Navy environmental compliance in southern California. These projects will enable the Fleets and SYSCOMS to collect future data required for environmental compliance at reduced costs. Funding in this topic areas, allows the Navy to meet environmental compliance requirements for impact analysis and avoid costly litigation. Funding in this topic area is particularly important because baseline habitat and movement patterns were a focus of litigation for the HSTT EIS. Plaintiffs sued the Navy for not adequately identifying and avoiding biologically important areas to marine mammals. Continued funding in these topic areas is necessary to support					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
future compliance documents and is also a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Title: Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1.113	1.760	2.732	0.000	2.732
Articles:	-	-	-	-	-
FY 2015 Accomplishments: As a result of reduced MMR funding in FY15, three major projects had their budgets reduced and their overall completion deadline extended. This included the Southern California (SOCAL) Behavioral Response Study (BRS). As a result of reduced funding, there was more limited time on the water to conduct the research trials, which resulted in less data being collected on the behavioral response of whales to tactical sonars. Due to reduced data collection, the project will need to be extended through FY17 instead of being completed in FY16 in order to obtain an adequate sample size. The reduction in funding resulted in more limited data available to generate behavioral response criteria and thresholds with NMFS to support our Phase III compliance permits. This in turn will result in additional costs to the Fleets/SYSCOMs in terms of increased compliance documentation costs, litigation risks, operational restrictions, and/or increased mitigation burden. Overall, the program continued research is to determine what constitutes behavioral response to Navy-generated sound on individuals with respect to disruption of natural behavior patterns, and studying the short and long-term effects of such disturbance. Research related to anatomically derived hearing properties for large whales will also continue since this is of interest to the regulator. ***FY 2016 Plans:*** Funding will be applied to the required focus area to support the refinement of criteria and thresholds for our at-sea training and testing permits which are required in FY18. Projects are often 1-2 year efforts and must be initiated in FY16 or they would jeopardize the ability to obtain authorization from regulatory agencies to conduct training and testing activities. Additional funding is required for the Navy's Southern California Behavioral Response project to support the close out and final analysis of field data collected over the past five years. Overall, the program will continue research to determine what constitutes biologically significant behavioral response to Navy-generated sound on individuals with respect to the disruption of natural behavior patterns, ascertaining the short and long-term effects of such disruptions and documenting avoidance behaviors.					

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Research regarding anatomically derived hearing properties for large whales will also continue since this is a priority of the regulator. Funding in these focus areas allows the Navy to meet environmental compliance requirements for impacts analysis and avoid costly litigation. ***FY 2017 Base Plans:*** Funding within this topic area will increase significantly in FY17 to continue to support research necessary to develop new criteria and thresholds for our Phase IV permits. These criteria and thresholds will need to be negotiated with the regulatory agencies in 2020. Since Projects are often 3-5 year efforts, they must be initiated and/or continued in FY17 in order to support this deadline. Any delay or reduction in funding in FY17 would jeopardize the Navy ability to develop appropriate criteria and thresholds needed to obtain authorization from regulatory agencies to continue to conduct training and testing activities. Additional funding is also required for the Navy Southern California Behavioral Response Study to support the additional year of effort that resulted from reduced funding in FY15. Funding in FY17 will support the analysis/synthesis of field data collected over the past five years and the development of a summary report on the behavioral effects of tactical sonar on marine mammals. Overall, the program will continue research to determine what constitutes behavioral response to Navy-generated sound on individuals with respect to the disruption of natural behavior patterns, and studying the short and long-term effects of such disturbance. Funding in this topic area is particularly important because of criteria and thresholds the effect of behavioral harassment on marine mammals are the focus litigation against Navy training and testing activities. Continued funding in these topics areas is a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Title: Mitigation Methodologies: Monitoring, New Technology, and Risk Assess	2.028	2.825	1.723	0.000	1.723
Articles:	-	-	-	-	-
FY 2015 Accomplishments: Due to a reduction in the MMR program budget in FY15, existing ongoing projects were delayed or their funding reduced to try to survive the funding shortfall. In particular, an active project developing automated tools for passive acoustic monitoring on Navy ranges had its funding delayed in FY15 to FY16. Also, due to limited funding several new starts were delayed in FY15 to FY16. The reduction in effort in this focus area will result in increased operational costs to the Fleets and SYSCOMs to conduct monitoring and continued cost growths in monitoring programs due to the lack of new, lower cost monitoring capabilities to meet the permit requirements.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
For instance, reduced investment in the M3R system impeded the ability to transition this program to the Fleets and SYSCOMs. MMR had to delay and extend the transition of M3R to the Fleets and SYSCOMs to FY16. This resulted in increased costs to the MMR program to continue to support its transition, as well as increased costs to the Fleets and SYSCOMs because they will have to rely on other more costly alternatives to monitoring until this system is available. While FY15 budget reductions to the MMR program only resulted in delays to the development and transition of technologies it created an increased financial burden to the Fleets and SYSCOMs to absorb higher monitoring costs and affected compliance with our monitoring permit requirements through the lack of necessary tools to adequate assess our impacts. In general, the reduced funding resulted in a delay in the development of all other monitoring technology projects, resulted in an overall increased operation cost to the Fleet monitoring program by not enabling them with efficient tools.					
FY 2016 Plans: To support our ongoing permit requirements to monitor the effects of at-sea training and testing activities, increased investment is required in this focus area to remain in compliance. Overall, the LMR program will continue to fund monitoring capabilities of marine animals to include the development of new technologies and improvements to existing technologies. In particular, investment in the use of UUV and AAVs will increase as these platforms have recently become more mature and are able to be leveraged to meet monitoring requirements with some modifications to their hardware. The Navy is also working to refine the High-Frequency Recording Package (HARP) which is our most common passive acoustic recording system in Navy-wide use for acoustic monitoring. Improvements to this system will increase the duration of deployments, increase the bandwidth and accuracy of recordings and reduce lifecycle maintenance costs. Increased funding in FY16 will be used to accelerate the transition of new or improved lower cost monitoring technologies to the Fleets and SYCOMs to reduce the impacts on readiness activities that current monitoring and mitigation technologies have.					
FY 2017 Base Plans: Funding within this topic area will decrease in FY17 as a result of the intended transition of costs associated with aspects of the M3R system to the Fleets and SYSCOMS and a shift in priority to accelerate projects funded under the Criteria and Thresholds, Physiology and Behavior, and Effects of Sound topic. To support our ongoing permit requirements to monitor the effects of at-sea training and testing activities, continued investment is required in this focus area to remain in compliance. Overall, the MMR program will continue to fund monitoring capabilities of marine animals to include the development of new technologies and improvements to existing technologies. In particular, investment in the use of UUV and AAVs will increase as these platforms have recently become more mature and are able to be leveraged to meet monitoring requirements with some modifications to their hardware. The Navy is also working to refine the High-Frequency Recording Package (HARP) which is our most common passive acoustic recording system in Navy-wide use for acoustic monitoring.					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Improvements to this system will increase the duration of deployments, increase the bandwidth and accuracy of recordings, and reduce lifecycle maintenance costs. Continued funding in FY17 will be used to accelerate the transition of new or improved lower cost monitoring technologies to the Fleets and SYCOMs to reduce the impacts on readiness activities that current monitoring and mitigation technologies have. Funding in this topic area is particularly important because of the Navy lack of additional mitigation tools beyond lookouts were a focus of litigation for the HSTT EIS. Continued funding in these topics areas is necessary to support future compliance documents and is also a requirement of a settlement agreement with the California Coastal Commission for the Hawaii - Southern California Training and Testing (HSTT) EIS/OEIS. Any reduction in funding would result in non-compliance with the settlement agreement and would subject the Navy to costly litigation. ***FY 2017 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	3.876	5.292	5.326	0.000	5.326

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

(U) RDTEN Contracts are Competitive Procurements.

E. Performance Metrics

Quarterly Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / *Environmental Protection*	Project (Number/Name) 9204 / *Marine Mammal Research*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgmt (Mar Ecol & Pop Dynamics)	WR	EXWC : Port Hueneme, CA	1.022	0.300	Dec 2014	0.550	Oct 2015	0.550	Oct 2016	-		0.550	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	NMMF : San Diego, CA	0.000	0.000		0.000		0.135	Oct 2016	-		0.135	0.000	0.135	-
Mitigation Methods	SS/CPFF	SDSU : San Diego, CA	0.000	0.000		0.000		0.216	Oct 2016	-		0.216	0.000	0.216	-
Criteria & Thresholds	SS/CPFF	SEAMARCO : Netherlands	0.000	0.000		0.000		0.276	Oct 2016	-		0.276	0.000	0.276	-
Mitigation Methods	WR	OASIS Technologies, Inc. : Lexington, MA	0.427	0.329	Dec 2014	0.354	Jan 2016	0.228	Oct 2016	-		0.228	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	U Saint Andrews : United Kingdom	0.000	0.000		0.000		0.163	Oct 2016	-		0.163	0.000	0.163	-
Mitigation Methods	SS/CPFF	Biowaves : San Diego, CA	0.000	0.000		0.000		0.139	Oct 2016	-		0.139	0.000	0.139	-
Mitigation Methods	WR	SPAWAR : San Diego, CA	0.000	0.169	Dec 2014	0.692	Jan 2016	0.127	Jan 2017	-		0.127	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Scripps Institute : San Diego, CA	0.000	0.250	Jan 2015	0.250	Oct 2015	0.251	Jan 2017	-		0.251	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Oregon State Univ : OR & HI	0.000	0.285	Jan 2015	0.321	Jan 2016	0.148	Jan 2017	-		0.148	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	WR	NAVAIR : Lakehurst, NJ	0.000	0.220	Jan 2015	0.082	Oct 2015	0.075	Oct 2016	-		0.075	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	SS/CPFF	BMC Inc. : Chicago, IL	0.000	0.215	Jan 2015	0.075	Jan 2016	0.151	Jan 2017	-		0.151	Continuing	Continuing	Continuing
Mitigation Methods	WR	NUWC : Newport, RI	8.363	0.560	Nov 2014	1.120	Jan 2016	0.614	Jan 2017	-		0.614	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	WR	NPGS : Monterey, CA	3.519	0.000		0.030	Oct 2015	0.030	Oct 2016	-		0.030	Continuing	Continuing	Continuing
Mar Ecol & Pop Dynamics	MIPR	NOAA SWFSC : La Jolla, CA	3.411	0.000		0.035	Oct 2015	0.065	Jan 2017	-		0.065	Continuing	Continuing	Continuing
Mitigation Methods	SS/CPFF	Scripps Institute : La Jolla, CA	9.435	0.280	Dec 2014	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy			Date: February 2016
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2015 Cost	FY 2015 Award Date	FY 2016 Cost	FY 2016 Award Date	FY 2017 Base Cost	FY 2017 Base Award Date	FY 2017 OCO Cost	FY 2017 OCO Award Date	FY 2017 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mitigation Methods	SS/CPFF	Oregon State Univ. : Corvallis, OR	1.853	0.155	Nov 2014	0.058	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	SPAWAR : San Diego, CA	3.133	0.000		0.642	Jan 2016	0.000		-		0.000	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	Cascadia Research Collective : Olympia, WA	4.194	1.113	Nov 2014	1.083	Oct 2015	1.859	Oct 2016	-		1.859	Continuing	Continuing	Continuing
Criteria & Thresholds	SS/CPFF	San Diego State Univ : San Diego, CA	2.244	0.000		0.000		0.299	Oct 2016	-		0.299	Continuing	Continuing	Continuing
		Subtotal	37.601	3.876		5.292		5.326		-		5.326	-	-	-

Remarks

Major performers in the projects will develops techniques for studying and collecting data on marine mammals. Several projects will provide methods to derive animal density from passive acoustics based technology. Other major projects include data standards development, signal processing technology development to accelerate analysis of large monitoring data sets and reduce cost, and data to support next-generation risk criteria based on improved and expanded hearing and behavioral response data.

	Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	37.601	3.876		5.292		5.326		-		5.326	-	-	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

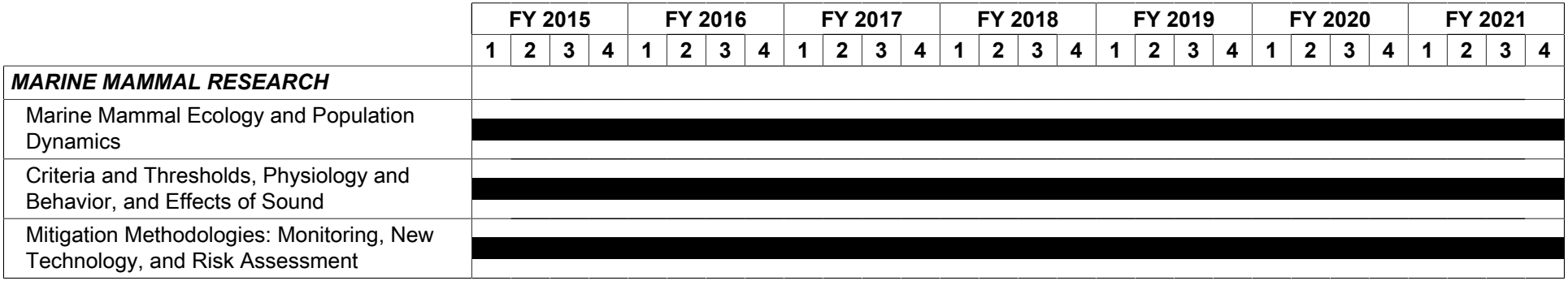

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603721N / *Environmental Protection*	**Project (Number/Name)** 9204 / *Marine Mammal Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MARINE MAMMAL RESEARCH				
Marine Mammal Ecology and Population Dynamics	1	2015	4	2021
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1	2015	4	2021
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1	2015	4	2021