

CONSTRUCTION

STATE	PROJECT (Construction)	PAGE
CALIFORNIA	AMERICAN RIVER COMMON FEATURES, NATOMAS BASIN, CA	1
CALIFORNIA	AMERICAN RIVER WATERSHED (FOLSOM DAM RAISE), CA	8
CALIFORNIA	HAMILTON CITY, CA	15
CALIFORNIA	ISABELLA LAKE, CA (DAM SAFETY)	20
CALIFORNIA	SACRAMENTO RIVER BANK PROTECTION PROJECT, CA	26
CALIFORNIA	SANTA ANA RIVER MAINSTEM, CA	36
CALIFORNIA	YUBA RIVER BASIN, CA	47
FLORIDA	HERBERT HOOVER DIKE, FL (SEEPAGE CONTROL)	55
FLORIDA	SOUTH FLORIDA ECOSYSTEM RESTORATION (EVERGLADES), FL	61
GEORGIA	SAVANNAH HARBOR EXPANSION, GA	91
ILLINOIS	OLMSTED LOCKS AND DAM, OHIO RIVER, IL & KY	99
ILLINOIS	UPPER MISSISSIPPI RIVER RESTORATION, IL, IA, MN, MO & WI	104
IOWA	MISSOURI RIVER FISH AND WILDLIFE RECOVERY, IA, KS, MO, MT, NE, ND & SD	117
KENTUCKY	ROUGH RIVER LAKE, KY	121
MARYLAND	POPLAR ISLAND, MD	124
MASSACHUSETTS	BOSTON HARBOR, MA	130
NEW JERSEY	RARITAN RIVER BASIN, GREEN BROOK SUB-BASIN, NJ	135
OREGON	COLUMBIA RIVER AT THE MOUTH, OR & WA	139
PENNSYLVANIA	EAST BRANCH CLARION RIVER LAKE, PA	144
TENNESSEE	CENTER HILL LAKE, TN	148
TEXAS	BUFFALO BAYOU AND TRIBUTARIES, TX	152
WASHINGTON	COLUMBIA RIVER FISH MITIGATION, WA, OR & ID (CRFM)	156
WASHINGTON	MUD MOUNTAIN DAM, WA	170
WEST VIRGINIA	BLUESTONE LAKE, WV	174

APPROPRIATION TITLE: Construction – Local Protection, Flood Risk Management

PROJECT: American River Common Features, Natomas Basin, California (Continuing)

LOCATION: The Natomas Basin extends northward from the American River and includes portions of the City of Sacramento and the counties of Sacramento and Sutter. In addition to the American and Sacramento rivers, the Natomas Basin is bordered on the north by the Natomas Cross Canal and on the east by the Pleasant Grove Creek Canal and the Natomas East Main Drainage Canal. The Natomas Cross Canal and the Pleasant Grove Creek Canal are engineered channels that divert the runoff from a large watershed in western Placer, southern Sutter and northern Sacramento counties around the Natomas Basin and are contributors to the flows in the upper reach of the Sacramento River channel. The Natomas East Main Drainage Canal is an engineered channel along the eastern side of the Natomas Basin. Tributaries to the Natomas East Main Drainage Canal include Dry Creek, Arcade Creek, Rio Linda Creek, Robla Creek, and the Magpie Creek Diversion Channel. An existing interconnected perimeter levee system reduces the flood risk in the Natomas Basin during high flows in these water bodies and in the American and Sacramento rivers.

The Natomas Basin is located within the Sacramento River watershed, which covers approximately 26,000 square miles in central and northern California. Shasta Dam impounds the upper Sacramento River watershed. Major tributaries of the Sacramento River include the Feather, Yuba and American rivers. The American River Watershed covers about 2,100 square miles northeast of the City of Sacramento and includes portions of Placer, El Dorado, Alpine, and Sacramento counties. The American River watershed includes Folsom Dam and Reservoir, inflowing rivers and streams, including the North, South, and Middle Forks of the American River, and the American River downstream to its confluence with the Sacramento River in the City of Sacramento. The Sacramento and American rivers, in the Sacramento area, form a flood plain covering approximately 110,000 acres at their confluence, approximately half of which comprises the Natomas Basin. The flood plain includes most of the developed portions of the City of Sacramento and the Natomas Basin. The Natomas Basin is hydraulically separable and is a separable element of the authorized American River, Common Features project.

DESCRIPTION: The Water Resources Reform and Development Act of 2014 authorized the construction of modifications of the ring levee system of the Natomas Basin. Specific features of this authorization include construction of approximately 42 miles of levee widening, 35 miles of seepage cutoff wall and 8 miles of seepage berm.

AUTHORIZATION: Water Resources Reform and Development Act of 2014, P.L. 113-121, Section 7002(2).

REMAINING BENEFIT-REMAINING COST RATIO: 3.4 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: 3.4 to 1 at 7 percent.

INITIAL BENEFIT-COST RATIO: N/A

BASIS OF BENEFIT-COST RATIO: Benefits are from the latest available evaluation approved in October 2014 at October 2013 price levels.

Division: South Pacific

District: Sacramento

American River Common Features, Natomas Basin, CA

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost	\$ 810,124,000		Entire Project	0	TBD
Estimated Non-Federal Cost	433,915,000				
Cash Contributions	386,988,000				
Other Costs	46,927,000				
Total Estimated Project Cost	\$ 1,244,039,000				
Authorized Cost (plus inflation)	1,273,960,000				
Maximum Cost Limit (Section 902)	1,503,416,000				
Allocations to 30 September 2014	19,465,000	6/			
Allocation for FY 2015	0				
Allocation for FY 2016	11,000,000				
Allocation for FY 2017	52,650,000	4/ 5/			
Allocations through FY 2017	83,115,000	1/ 2/ 3/ 5/	10		
Estimated Unobligated Carry-In Funds	400,000	4/			
President's Budget for FY 2018	20,550,000		13		
Programmed Balance to Complete after FY 2018	706,459,000				
Un-programmed Balance to Complete after FY 2018	0				

1/ \$0 reprogrammed to (from) the project.

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$10,931,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$400,000.

5/ PED costs of \$6,000,000 are included in this amount.

6/ Allocations of \$18,465,000 transferred from the American River Common Features WRDA 96/99 project for Natomas PED and Post Authorization Change Report (PACR) work completed under that authorization.

PHYSICAL DATA: The principal features of the recommended modification include widening of about 41.9 miles of existing levee, installation of about 34.8 miles of soil bentonite cutoff wall, installation of about 8.3 miles of seepage berms and bridge remediation at State Route 99.

Division: South Pacific

District: Sacramento

American River Common Features, Natomas Basin, CA

JUSTIFICATION: The flood of 1986 (flood of record) nearly caused numerous levee failures into the Natomas Basin. Other floods, including the 1997 flood event, have had similar effects. As a result of significant flood fight efforts, these flood events passed without full levee failures.

Levee failure in the Natomas Basin along the American River, Sacramento River, Natomas Cross Canal, Pleasant Grove Creek Canal or Natomas East Main Drainage Canal could result in flooding of more than 55,000 acres, affecting approximately 100,000 residents, with damages of up to \$8 billion. There are approximately up to 23,000 structures in the Natomas Basin that would be flooded with a levee failure. Most of these are residential but portions are commercial structures. Flooding of some of the commercial structures could have significant economic and environmental impacts (gas and oil products, agricultural chemicals, electricity generation and transmission, transportation systems, etc.).

The American River Common Features, Natomas Basin project consists of seepage stability levee improvements for the 42 miles of levee surrounding the Natomas Basin and would decrease the probability of flood damage to about a 1 in 67 chance in any given year. With construction of the project, the average annual damages are projected to decrease from \$399,000,000 to \$28,100,000.

The Population At Risk and Population Affected are both 100,000 and the risk depth is approximately 15 feet but goes up as high as 25 feet. Risk warning times depend on location of a levee failure but the people who live nearby the point of failure would have very little time to react and seek safety. With a levee failure, egress route of the Natomas Basin could also become quickly impassable because of flooding.

Average annual benefits, all flood risk management are estimated to be \$371,000,000.

FISCAL YEAR 2017: The appropriated funds, plus carry-in funds, will be applied as follows:

Complete construction of Reach D to move a drainage canal away from the levee due to seepage issues, remove pipelines through and under the levee at three pump stations, and build seepage and stability remediation on portions of the Natomas Cross Canal within the Natomas Basin	\$6,500,000
Continue design of Reaches A & B to correct seepage and stability issues on a portion of the Sacramento River within the Natomas Basin	\$5,031,000
Award construction contract for Reach I Contract 1 for construction of seepage improvements on the American River within the Natomas Basin.	\$18,000,000
Engineering & Design, Construction Management, & Supervision & Administration	5,500,000
Geotech explorations (Reaches E, F & G)	\$1,500,000
Design and Take Letter for Reach E	\$550,000
Design and Take Letter for Reaches F & G	\$1,100,000
Construct Reach H	\$25,000,000
Total	\$63,181,000

FISCAL YEAR 2018: The budgeted amount will be applied as follows:

Real estate acquisitions for Reaches A & B	\$7,500,000
Continue design of Reach E and preparation of a supplemental EIS	\$5,000,000
Real estate acquisitions for Reach E	\$4,400,000
Continue design on Reaches A & B	\$2,500,000
Prepare contract for Reach I Contract 2	\$500,000
Close out construction contract on Reach I Contract 1	\$200,000
Close out construction contract on Reach D	\$450,000
Supervision and Administration	\$400,000
Total	\$20,950,000

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsor must comply with the requirements listed below.

	Payments During Construction and Costs	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement
Requirements of Local Cooperation Reimbursements		
Provide lands, easements, rights of way, and dredged or excavated material disposal areas, which may be reduced for credit allowed for work in kind (Section 104 of the Water Resources Development Act of 1986, as amended, after reductions for such credit have been made in the required cash payments.	\$46,927,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.		
Pay 5 percent of the costs allocated to flood risk management to bring the total non-Federal share of flood risk management costs to 35 percent as determined under Section 103 (m) of the Water Resources Development Act of 1986, as amended, to reflect the non-Federal sponsor's ability to pay, but no less than 5 percent of the costs allocated to flood risk management, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood risk management features.	\$386,988,000	\$5,973,000
Total Non-Federal Costs	\$433,915,000	

The non-Federal sponsor has also agreed to make all required payments with project construction.

STATUS OF LOCAL COOPERATION: The non-Federal sponsors are the State of California Central Valley Flood Protection Board (CVFPB) and the Sacramento Area Flood Control Agency (SAFCA). The Project Partnership Agreement (PPA) was signed in August 2016. The project is authorized for construction by the Water Resources Reform and Development Act of 2014 at a total first cost of \$1,147,280,000. The cost sharing for construction of the project will be 65 percent Federal and 35 percent non-Federal in accordance with WRDA 1996.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$810,124,000 is a decrease of \$4,475,000 from the latest estimate (\$814,599,000) presented to Congress (FY 2017). This change includes the following items:

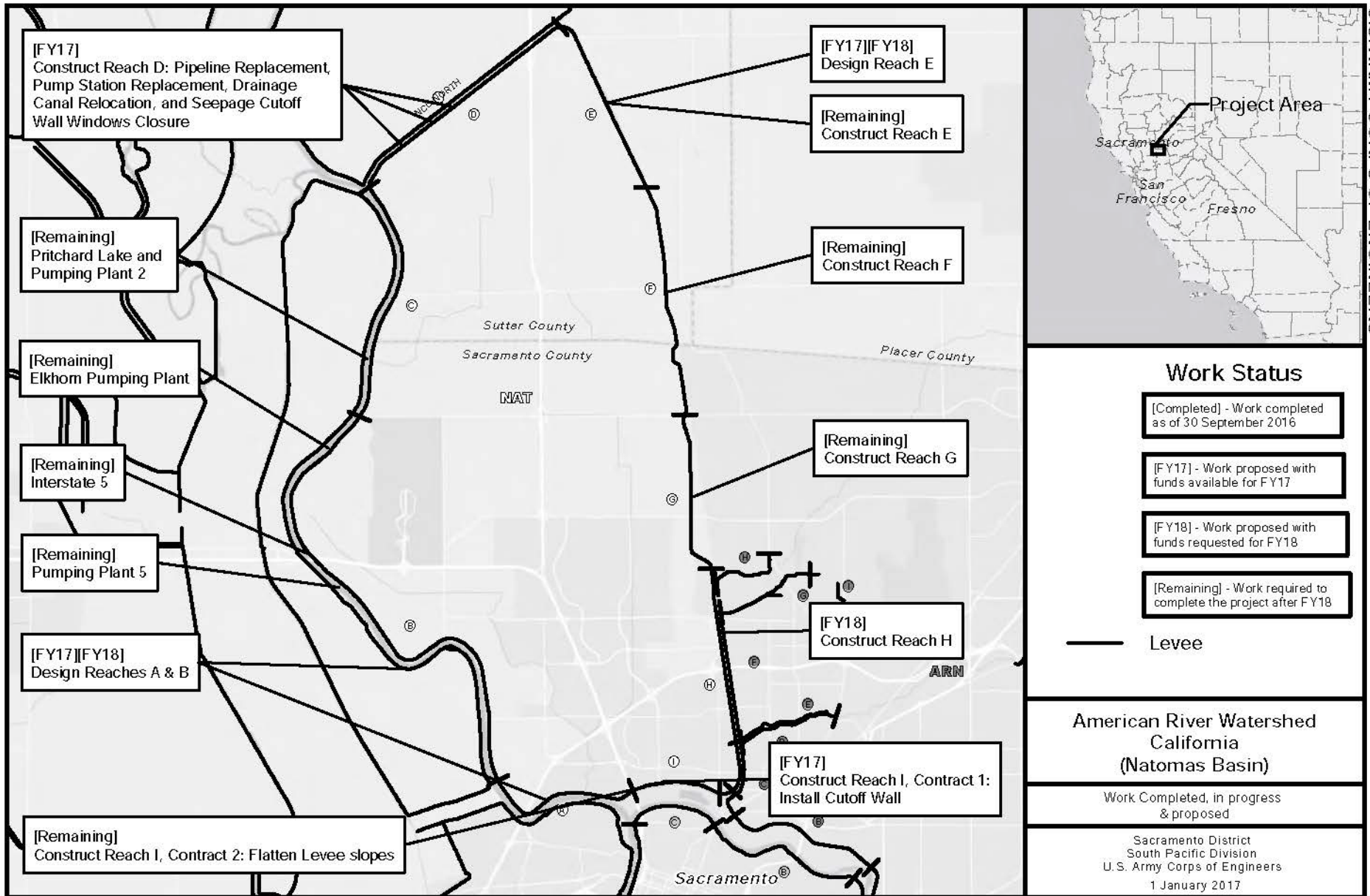
Item	Amount
Price Escalation or De-escalation on Construction Features	(\$4,475,000)
Division: South Pacific	District: Sacramento American River Common Features, Natomas Basin, CA

Total

(\$4,475,000)

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: An Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was filed with the Environmental Protection Agency in October 2010 and a Record of Decision (ROD) was filed in May 2011.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY 2014 and funds to initiate construction were appropriated in FY 2016. Fish and Wildlife Mitigation costs in the amount of \$19,877,000 will be utilized for mitigation of levee improvement construction.



Division: South Pacific

District: Sacramento

American River Common Features, Natomas Basin, CA

APPROPRIATION TITLE: Construction – Flood Risk Management, Fiscal Year 2018

PROJECT: American River Watershed, Folsom Dam Raise, California (Continuing)

LOCATION: The project is located in Placer, El Dorado and Sacramento Counties and comprises the North, Middle and South Forks of the American River that flow westward into Folsom Lake. The outflow of the lake through Folsom Dam then flows through the city of Sacramento and into the Sacramento River. The system includes the Folsom Dam and Reservoir, located on the American River, about 29 miles upstream of the city of Sacramento, California. The American River watershed drains about 2,100 square miles northeast of Sacramento.

DESCRIPTION: The Chief's Report for the entire American River Watershed was completed on November 5, 2002. A Post Authorization Change Report (PACR) dated May 7, 2007 recommended the Raise design be refined from 7-foot raise to a 3.5-foot raise. The originally authorized project to raise Folsom Dam 3.5 feet includes raising related dikes, right and left dams, Mormon Island Auxiliary Dam, replacement/modification of three emergency spillway tainter gates, construction of a temporary bridge downstream of Folsom Dam, and three ecosystem restoration projects, including the temperature control shutters project and two downstream sites, Woodlake site and Bushy Lake site. The bridge was needed to mitigate traffic impacts from construction of the dam raise and was planned to be removed after completion of the dam raise. Subsequent legislation authorized construction of a permanent bridge at 100 percent Federal expense. The City of Folsom signed a Project Cooperation Agreement in November 2006 to construct the bridge at 65 percent Federal and 35 percent non-Federal expense. The bridge was completed in 2009. The Central Valley Flood Protection Board (CVFPB) and the Sacramento Area Flood Control Agency (SAFCA) are scheduled to sign a Project Partnership Agreement (PPA) in December 2017. All work to-date on the Dam Raise has been conducted using appropriated Federal funds. However, once the PPA is executed, the project will be cost shared 65 percent Federal and 35 percent non-Federal. This is a multi-purpose project whose primary purpose is flood risk management, however it also incorporates ecosystem restoration features as shown in the 2007 PACR.

AUTHORIZATION:

Folsom Bridge – Energy and Water Development Appropriations Act (EWDAA), Pub. L. 108-137, §§ 128, 134, 117 Stat. 1827 (2004); Energy and Water Development Appropriations Act, Pub. L. 109-103, 119 Stat. 2247 (2006); Energy and Water Development Appropriations Act, Pub. L. 110-161, § 130, 121 Stat. 1937, 1947 (2008); Omnibus Appropriations Act 2009, Pub. L. 111-8, § 109, 123 Stat. 524 (2009)

Folsom Dam Raise – Section 3029 of the Water Resources and Development Act of 2007, 110 H.R. 1495

REMAINING BENEFIT-REMAINING COST RATIO: 2.4 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: 1.8 to 1 at 7 percent

INITIAL BENEFIT-COST RATIO: 3.4 to 1 at 6-7/8 percent (2001)

BASIS OF BENEFIT-COST RATIO (BCR): Folsom Dam Raise – Benefits and costs were updated in the American River Watershed Common Features Project (WRDA 1996/1999) Economic Update dated June 2011. The Folsom Dam Modifications must be completed to realize full benefits. The Dam Raise is the basis for future benefits and the basis of the BCR.

Division: South Pacific

District: Sacramento

American River Watershed, Folsom Dam Raise–Bridge, CA

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
<u>Folsom Dam Raise</u>						
Estimated Federal Costs		\$193,389,000				
Flood Risk Management	\$145,744,000					
Ecosystem Restoration (Programmed)	\$ 23,596,000			Folsom Dam Raise Ecosystem Restoration	10 <u>7</u> / 2	TBD TBD
Ecosystem Restoration (Unprogrammed)	\$ 24,049,000					
Estimated Non-Federal Costs		103,620,000				
Flood Risk Management	\$ 77,965,000					
Ecosystem Restoration (Programmed)	\$ 12,705,000					
Ecosystem Restoration (Unprogrammed)	\$ 12,950,000					
Total Folsom Dam Raise		\$297,009,000				
<u>Folsom Temporary Bridge</u>						
Estimated Federal Costs		\$ 90,321,000	<u>8</u> /	Folsom Dam Bridge	100	Jun 2009
Estimated Non-Federal Costs		10,322,000		Mitigation	100	2017
Cash Contribution	\$ 10,322,000					
Total Folsom Bridge		\$100,643,000				
Project Summary						
Estimated Federal Costs		\$283,710,000		PHYSICAL DATA		
Estimated Non-Federal Costs		113,942,000				
Cash Contribution	\$113,942,000					
Total Estimated Programmed Construction Cost		\$360,653,000				
Total Estimated Unprogrammed Construction Cost		\$ 36,999,000				
Total Estimated Project Costs		\$397,652,000		Folsom Dam – Raise 3.5 feet - Dikes 1-8		
Authorized Cost (plus inflation)		\$409,707,000		- Mormon Island Auxiliary Dam		
Maximum Cost Limit (Section 902)		\$479,616,000		- Right Wing and Left Wing Dams		

Division: South Pacific

District: Sacramento

American River Watershed, Folsom Dam Raise–Bridge, CA

Allocations to 30 September 2014	\$119,025,815			Replacement/Modification – 3 Emergency Spillway Tainter Gates
Allocation for FY 2015	1,710,000			Temporary Bridge
Allocation for FY 2016	18,641,000			Permanent Bridge
Allocation for FY 2017	0			
Allocations through FY 2017	139,376,815	1/2/3/5/	49	
Estimated Unobligated Carry-In Funds	8,370,000	4/		Bushy Lake Ecosystem Restoration
President's Budget for FY 2018	5,775,000		51	Woodlake Ecosystem Restoration
Programmed Balance to Complete after FY 2018	138,558,185	6/		Automated Temperature Shutters
Un-programmed Balance to Complete after FY 2017	\$ 36,999,000			

1/ \$2,317,097 reprogrammed from the project.

2/ \$229,037 rescinded from the project.

3/ \$170,000 transferred to the Flood Control and Coastal Emergencies account.

4/ Unobligated Carry-In Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$14,773,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$8,378,000.

5/ PED costs of \$10,229,402 are included in this amount.

6/ For programmed work only; one of the two elements of remaining ecosystem restoration work in the amount of \$36,999,000 is unprogrammed pending a decision to construct these features.

7/ Reflects physical completion for Folsom Dam Raise portion only.

8/ Temporary bridge is now reflected under Folsom Bridge cost only. Funds of \$48,300,000 are authorized to be appropriated for the permanent bridge at 100 percent Federal expense.

JUSTIFICATION: Folsom Dam and Reservoir are key features for flood risk management for Sacramento. The existing Folsom Dam and Reservoir project has a capacity of 975,000 acre-feet, which includes a minimum of 400,000 acre-feet of space seasonally dedicated to the mitigation of flood risk. Significant rainfall in recent years has filled Folsom Lake and necessitated record releases in excess of design flow downstream. The levees along the American River are designed to accommodate releases from Folsom Dam of up to 115,000 cfs. Downstream levees would likely fail with sustained flows above this level. Levee failure along the lower American River and Sacramento River could result in flooding of more than 100,000 acres, with damages of up to \$58 billion, depending on the magnitude of the event. The Folsom Dam Raise project would further reduce the risk of flood damage to about a 1 in 185 chance in any given year. The population at risk is up to 900,000, and the risk warning time under some conditions is 12 hours. There is limited egress and ingress across the Sacramento and American rivers. A large flood could also result in disruption of drinking water supplies with statewide impacts.

Average annual benefits (October 2010 price levels) are as follows:

Annual Benefits	Amount
Flood risk management	\$28,800,000
Other (de-watering, debris removal levee repair costs)	2,158,000
Total	\$30,958,000

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be applied as follows:

<u>Folsom Dam Raise</u>	
Continue Design of Emergency Gates	\$2,034,600
Continue Design of first work package of dikes (4, 5, & 6)	1,803,500
Design of Left Wing Dam, Right Wing Dam, Dikes 1, 2, 3, 7 & 8, and MIAD	2,538,800
<u>Folsom Dam Temporary Bridge</u>	
Mitigation and monitoring and project closeout	18,100
Total	\$6,395,000

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

<u>Folsom Dam Raise</u>	
Construction management for construction contract (Emergency Gates)	\$ 5,500,000
Award construction contract on first work package of dikes (4, 5, & 6)	8,215,000 4/
Second work package (dikes 1, 2 & 3)	
Continue design of Left Wing Dam, Right Wing Dam, Dikes 7 & 8, and Mormon Island Auxiliary Dam	260,000 4/
<u>Folsom Dam Bridge</u>	
Mitigation and monitoring and project closeout	178,000 4/
Total	\$14,153,000 4/

Division: South Pacific

District: Sacramento

American River Watershed, Folsom Dam Raise–Bridge, CA

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the non-Federal sponsor must comply with the requirements listed below.

NON-FEDERAL COSTS: (Continued)

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
<u>Total Folsom Dam Raise – Raise Component</u>		
Pay 35 percent of the costs allocated to flood control to bring non-Federal share to 35 percent, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood control facilities.	\$ 77,965,000	<u>10/</u>
Pay 35 percent of the costs allocated to ecosystem restoration to bring non-Federal share to 35 percent, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of ecosystem restoration facilities	\$ 25,655,000	
<u>Total Folsom Dam Raise – Bridge Component</u>		
Pay 35 percent of the costs allocated to flood control, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood control facilities (refers to temporary portion of the bridge).	\$ 10,322,000	
Total Folsom Dam Raise (including Bridge) Non-Federal Costs	\$113,942,000	

10/ The operation and maintenance (O&M) will continue to be performed by US Bureau of Reclamation (USBR). An initial cost-sharing agreement will be negotiated between SAFCA and USBR to pay the portion of O&M costs related to the new flood control features. Amount is for both Folsom Dam Modifications (Joint Federal Project - JFP) and Folsom Dam Raise.

STATUS OF LOCAL COOPERATION: The CVFPB and SAFCA are the non-Federal sponsors for the Folsom Dam Raise. The PPA for the flood risk management portion of the Dam Raise is scheduled for execution in December 2017. The non-Federal sponsors are financially capable and willing to contribute the non-Federal share. The non-Federal sponsors have also agreed to make all required payments concurrently with project construction.

The City of Folsom is the non-Federal sponsor for the Folsom Bridge Project. The Project Cooperation Agreement was executed on November 22, 2006.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$283,710,000 is an increase of \$46,934,000 from the latest estimate (\$236,776,000) presented to Congress (FY 2017). This change includes the following items:

Division: South Pacific

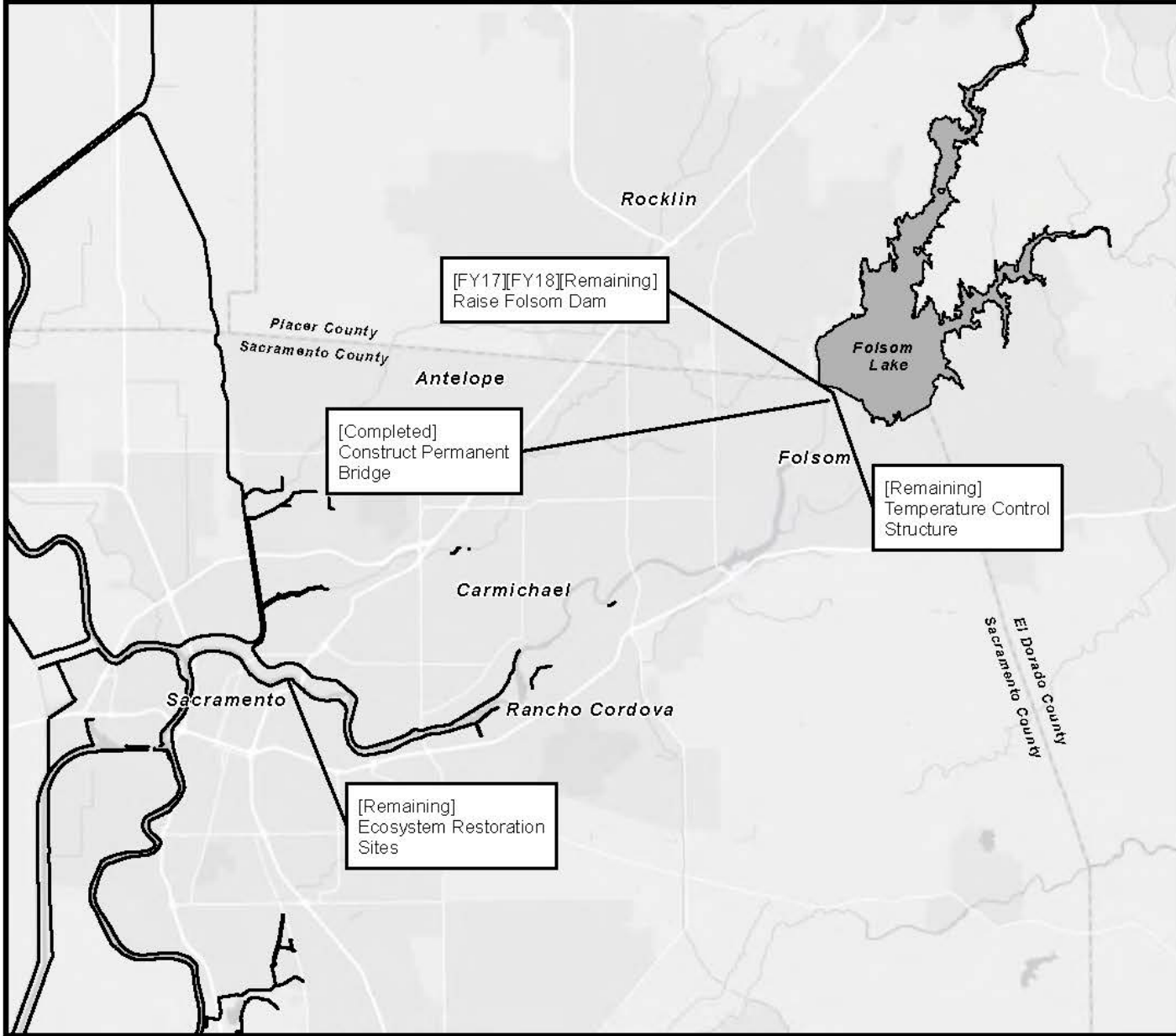
District: Sacramento

American River Watershed, Folsom Dam Raise–Bridge, CA

Item	Amount
Price Escalation or De-Escalation on Construction Changes	\$ (8,227,000)
Additional Functions Added under General Authority	36,301,000
Design Changes	18,860,000
Total	\$ 46,934,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The Corps will prepare an Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

OTHER INFORMATION: Funds used to initiate preconstruction engineering and design for the American River Watershed project were allocated in FY 1992. Funds to initiate construction were appropriated in FY 2004. Fish and wildlife mitigation costs are currently not expected to be significant.



Work Status

[Completed] - Work completed as of 30 September 2016

[FY17] - Work proposed with funds available for FY17

[FY18] - Work proposed with funds requested for FY18

[Remaining] - Work required to complete the project after FY18

American River Watershed California (Folsom Dam Raise and Bridge)

Work Completed, in progress & proposed

Sacramento District
South Pacific Division
U.S. Army Corps of Engineers
1 January 2017

APPROPRIATION TITLE: Construction – Aquatic Ecosystem Restoration, Fiscal Year 2018

PROJECT: Hamilton City, California (Continuing)

LOCATION: Hamilton City is located along the west bank of the Sacramento River in Glenn County, California about 85 miles north of the City of Sacramento. The project area and city are bounded on the east by the Sacramento River, and to the west by the Glenn Colusa Canal. The area lies north of existing Sacramento River levees and is not protected by them. The project boundaries extend about two miles north and six miles south of Hamilton City.

DESCRIPTION: The Chief's Report for Hamilton City, Glenn County, California, signed December 22, 2004, recommended a multi-purpose flood damage reduction and ecosystem restoration project to Congress. On July 21, 2014, the Sacramento District executed a Project Partnership Agreement with Reclamation District 2140 as the non-Federal sponsor, setting the Federal share at 65-percent Federal and the non-Federal share at 35-percent for the construction phase of the project. Specifically, this project will construct a setback levee about 6.9 miles long and degrade an existing "J" levee, actively restoring 1,100 acres of riparian woodland, 248 acres of riparian shrub, and 67 acres of floodplain meadow now cut off by that levee. To accomplish ecosystem restoration, most of an existing "J" levee will be removed to reconnect the river to the floodplain and allow for overbank flooding. The new setback levee will begin two miles north of Hamilton City and will tie into high ground near the end of the "J" levee to prevent flows greater than a 250 year event from wrapping around the setback levee and passing over County Road 23 into populated areas. The levee will have a 90 percent reliability of passing a 75 year event and will reduce flood risk to the Hamilton City wastewater treatment plant, the Town of Hamilton City, and adjacent agricultural lands while providing significant habitat acreage in the floodplain. All work is programmed.

AUTHORIZATION: Water Resources Development Act of 2007, Public Law 110-114, § 100(8), 121 Statute 1049, 1050 (2007); Water Infrastructure Improvements for the Nation (WIIN) Act of 2016, Public Law 114-322, Section 1320

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable because this project is funded based on anticipated environmental return.

INITIAL BENEFIT-COST RATIO: Not applicable because this project is funded based on anticipated environmental return.

TOTAL BENEFIT-COST RATIO: An incremental cost analysis of project identified restoration benefits of 888 average annual habitat units (AAHUs) and average annual flood risk management benefits of \$608,000.

BASIS OF BENEFIT-COST RATIO: A separable cost-remaining benefit analysis was performed to separate out costs associated with features that produce joint benefits. Project justification is based on ecosystem restoration and flood risk management as described in the December 2004 Chief's Report. An Economic Reevaluation Report (ERR) was completed and approved in May 2015.

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost		\$48,753,000		Phase 1 Levee Phase 2 Levee Phase 1 & 2 Revegetation		2017 TBD TBD
Estimated Non-Federal Cost		25,982,000				
Cash Contributions	6,502,000			Entire Project	28	TBD
Other Costs	19,480,000					
Total Estimated Project Cost		\$74,735,000				
Authorized Cost (plus inflation)		91,000,000				
Maximum Cost Limit (Section 902)		109,200,000				
Allocations to 30 September 2014		11,421,000				
Allocation for FY 2015		3,800,000				
Allocation for FY 2016		15,000,000				
Allocation for FY 2017		0				
Allocations through FY 2017		30,221,000	1/ 2/ 3/ 5/	62		
Estimated Unobligated Carry-in Funds		0	4/			
President's Budget for FY 2018		8,325,000		79		
Programmed Balance to Complete after FY 2018		\$ 10,207,000				
Un-programmed Balance to Complete after FY 2018		0				

1/ \$140,000 reprogrammed to the project (FY 2008).

2/ \$2,000 rescinded from the project (FY 2006).

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated balance from FY 2016 into FY 2017 for this project is \$11,899,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$2,821,000 are included in this amount.

PHYSICAL DATA: From north to south, 4.4 miles of levee will provide a 90 percent confidence of passing a 75 year event (to include Hamilton City proper); 1,000 feet of levee will provide a 90 percent confidence level of passing a 35 year event; 1.6 miles of levee will provide a 90 percent confidence level of passing an 11 year event. This project includes the construction of 6.9 miles of setback levee to improve flood protection and the restoration of approximately 1,500 acres of native habitat, which primarily includes the planting of woody vegetation that is indigenous to the Sacramento River flood plain.

JUSTIFICATION: The project was formulated to maximize use of integrated "joint" features (features that produce both ecosystem restoration and flood risk management benefits). A separable cost-remaining benefit analysis was performed to separate out costs associated with features that produce joint benefits.

Division: South Pacific

District: Sacramento

Hamilton City, CA

JUSTIFICATION (Continued): Ecosystem Restoration - Over 95 percent of the Sacramento River's floodplains (riparian and wetland habitats) have been lost due to development and agriculture. This project will restore approximately 1,500 acres of floodplain habitat with all the land between an existing levee and the new setback levee restored to a natural floodplain. A variety of habitat types will be restored to include riparian scrub, oak savannah, and grassland communities. Restoration of this floodplain will benefit the recovery of eight Federally-listed or proposed species in the area, including: winter-run Chinook salmon, steelhead trout, Valley Elderberry Longhorn Beetle, and Swainson's Hawk. The restoration will provide vital habitat (nesting, foraging, and shelter) to these species and increase biodiversity to more natural levels. This restoration has planned collaboration with other federal, state, local, and non-profit agencies, as part of a system-wide initiative to establish a continuous riparian corridor along the Sacramento River. The Hamilton City project is a key component of this effort because it will connect four more restored areas to provide a continuous habitat corridor far larger than the project's restoration footprint. Benefits will be incremental starting immediately after planting and full benefits realized by approximately year ten or sooner.

Flood Risk Management - Record flood flow occurred in 1974 when a privately constructed "J" levee failed. Extensive flood fighting and evacuation took place in 1983, 1986, 1995, 1997, and 1998. The flood risk management average annual benefits are estimated at \$608,000 (2014 Economic Reevaluation Report).

FISCAL YEAR 2017: The carry-in funding is being applied as follows:

S&A and EDC (continuing from FY16 Phase 1 Revegetation, Option 1 Service Contract and Phase 2 Levee Construction Contract)	\$ 1,350,000
Award Phase 1 Option 2 Revegetation Service Contract and Phase 2 Option 1 Revegetation Service Contract	10,549,000
Total	\$ 11,899,000

FISCAL YEAR 2018: The budgeted amount plus carry-in funds will be applied as follows:

S&A for Phase 2A Levee contract (prior year)	\$ 250,000
Award Phase 2B Levee contract (includes S&A)	8,075,000
Total	\$8,325,000

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986 the non-Federal sponsor must comply with the requirements listed below:

	Payments During Construction And Reimbursements	Annual Operation Maintenance, Repair, Rehabilitation, and Replacement Costs
Requirements of Local Cooperation		
Provide lands, easements, rights of way, and borrow and excavated or dredged material disposal areas, which are partially offset by a credit allowed.	\$17,750,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary in the construction of the project.	1,730,000	
Pay 8.4 percent of the costs allocated to ecosystem restoration to bring the total non-Federal share of ecosystem restoration costs to 35 percent, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood control and ecosystem restoration facilities.	6,502,000	
Total Non-Federal Costs	\$25,982,000	

The non-Federal sponsor has also agreed to make all required payments concurrently with project construction.

STATUS OF LOCAL COOPERATION: The Project Partnership Agreement was executed on July 21, 2014, with the Reclamation District 2140. The project is authorized for construction by the Water Resources Development Act (WRDA) of 2007 at a total first cost of \$52,400,000. The cost sharing for construction of the project will be 65 percent Federal and 35 percent non-Federal in accordance with WRDA 1996. Our analysis of the non-Federal sponsor's financial capability to participate in the project affirms that the sponsor has a reasonable and implementable plan for meeting its financial commitment.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$48,753,000 is an increase of \$847,000 from the latest estimate (\$47,906,000) presented to Congress (FY 2017).

Item	Amount
Construction Features and Management	\$847,000
Total	\$847,000

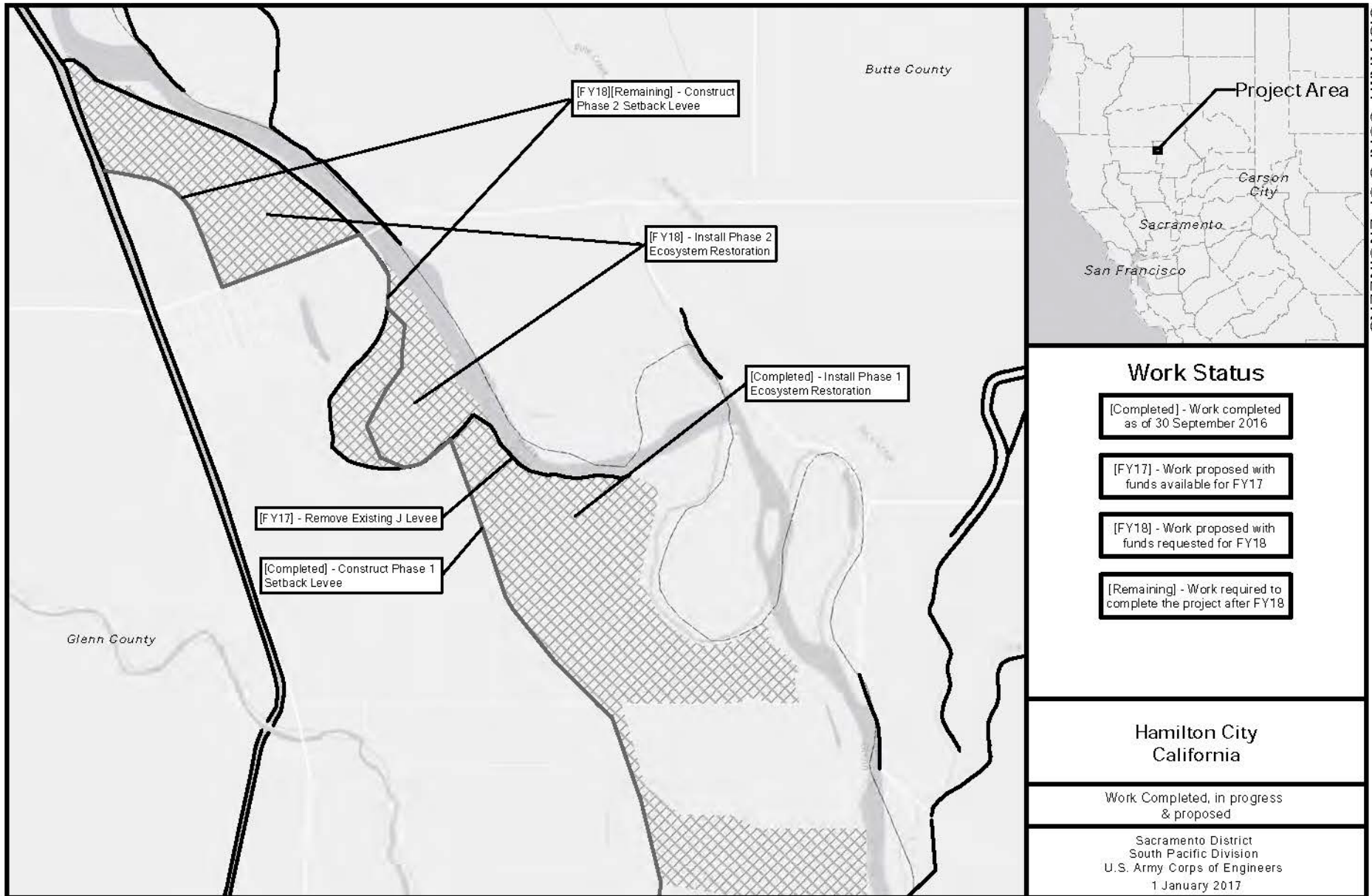
STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: A combined Environmental Impact Statement/Environmental Impact Report (EIS/EIR), along with the Feasibility Report, was completed in July 2004.

OTHER INFORMATION: Preconstruction, engineering and design (PED) funds were received in 2005. Construction funds were received in FY 2014.

Division: South Pacific

District: Sacramento

Hamilton City, CA



Division: South Pacific

District: Sacramento

Hamilton City, CA

APPROPRIATION TITLE: Construction – Dam Safety, Fiscal Year 2018

PROJECT: Isabella Dam, California - Dam Safety Seismic Remediation (Dam Safety Assurance) (Continuing)

LOCATION: The Isabella Dam is located approximately 40 miles northeast of Bakersfield, near the confluence of the north and south forks of the Kern River, in Kern County, California.

DESCRIPTION: Per the Dam Safety Modification Report (DSMR) dated December 2012, there are three primary deficiencies (hydrologic, seismic, and seepage/piping) at the project that could lead to significant life loss in the event of a dam failure. Work to be performed includes: continuing preconstruction engineering and design (PED) of the Isabella Main and Auxiliary Dams, embankment, emergency Labyrinth spillway, the Borel outlet works, and construction of a flood protection closure gate along Highway 155. The recommended flood risk management plan consists of the following: 1) a new Emergency Spillway (including a 300-foot wide Labyrinth weir) with 16-foot raises to the Main and Auxiliary Dams to pass the probable maximum flood (PMF); 2) buttress and foundation treatments at the Auxiliary dam to increase seismic stability and remediate seepage concerns; 3) a filter and drain system in the downstream slope of the Main dam to increase stability; 4) modification of the existing spillway to raise the spillway walls, anchor the walls and ogee crest for the additional head during operation, and line the chute with concrete to mitigate for plucking and erosion; and 5) purchase of the Borel Canal easement through the Auxiliary Dam and payment of just compensation to Southern California Edison for the loss of water to the Borel Hydroelectric Project. Caltrans Highway 155 must be modified to accommodate the 16-foot dam raise. Construction efforts will include all the real estate actions and actions associated with the relocation of the United States Forest Service (USFS) office, fire and recreation facilities. The relocation related items include demolition and relocation of existing USACE and USFS facilities and the relocation of private residences. Several interim risk reduction measures (IRRM) are in place to reduce the risk until long term risk reduction measures are implemented. An emergency reservoir pool restriction is presently in place to reduce the seepage-piping and seismic risk. The cost of the project is initially funded at 100 percent Federal expense from appropriations provided to the U.S. Army Corps of Engineers. However, 4.033 percent of the total project cost will be reimbursed over time to the U.S. Treasury, within a period of 30 years following completion of construction – the North Kern Water Storage District and the Buena Vista Water Storage District are responsible for 3.255 percent of the total project cost while the local power companies with downstream hydroelectric plants are responsible for 0.775 percent of the total project cost. All work is programmed.

AUTHORIZATION: Flood Control Act of 1944, P.L. 78-534, Chapter 665, Sec. 10

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable since the project is a dam safety project.

TOTAL BENEFIT-COST RATIO: Not applicable since the project is a dam safety project.

INITIAL BENEFIT-COST RATIO: Not applicable since the project is a dam safety project.

BASIS OF BENEFIT-COST RATIO: Dam Safety Modification Report (DSMR), December 2012

Division: South Pacific

District: Sacramento

Isabella Dam, (Dam Safety), CA

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PERCENT COMPLETE	COMPLETION SCHEDULE
Estimated Total Appropriation Requirement	\$ 654,204,000				
Future Non-Federal Reimbursement	25,590,500				
Estimate Federal Cost (Ultimate)	\$ 628,613,500		Main Dam Raise	0	TBD
			Auxiliary Dam Raise	0	TBD
Estimated Non-Federal Cost	\$ 25,590,500		Labyrinth Spillway	0	TBD
Cash Contributions	0		Completion 2022		
Other Costs	0				
Reimbursements	25,590,500				
Total Estimated Project Cost	\$ 654,204,000	<u>8/</u>			
Authorized Cost (plus inflation)	593,478,000	<u>7/</u>			
Admin Maximum Cost Limit (Section 902)	\$ 746,236,000	<u>6/</u>			
Allocations to 30 September 2014	\$ 37,449,000				
Allocation for FY 2015	20,400,000				
Allocation for FY 2016	71,900,000				
Allocation for FY 2017	70,500,000				
Allocations through FY 2017	200,249,000	<u>1/ 2/ 3/ 5/</u>		31	
Estimated Unobligated Carry-In Funds	0	<u>4/</u>			
President's Budget for FY 2018	58,000,000			39	
Programmed Balance to Complete after FY 2018	395,955,000				
Un-programmed Balance to Complete after FY 2018	\$ 0				

1/ \$12,700,000 reprogrammed to the project.

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Unobligated Carry-in Funding: The actual unobligated balance from FY 2016 into FY 2017 for this project is \$59,882,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$50,865,000 are included in this amount.

6/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

7/ Authorized Cost based on the 2012 DSMR, updated by the Conditional Cost Agency Technical Review Certification dated July 2, 2015.

8/ Includes special authorization for USFS relocations of \$45,198,000 that was not included in the original authority and therefore does not contribute to the 902

Division: South Pacific

District: Sacramento

Isabella Dam, (Dam Safety), CA

calculation.

PHYSICAL DATA: The existing project is comprised of a 185 foot high earthfill Main dam, an ungated ogee concrete spillway, and a 100 foot high earthfill Auxiliary Dam located approximately one half mile east of the Main Dam. The reservoir has a gross storage capacity of 568,075 acre feet.

JUSTIFICATION: Isabella Dam is a Dam Safety Action Classification (DSAC) 1, which is defined by ER 1110-2-1156 as "Very High Urgency" where progression toward failure is confirmed to be taking place under normal operations, and the dam is almost certain to fail under normal operations within a few years without intervention; or the incremental risk – combination of life and economic consequences with probability of failure – is very high. The spillway capacity is inadequate, and there are known seismic and seepage hazards that could cause deformation of the structures. Reservoir restriction will be extended until construction of the modifications is completed. The interim reservoir restriction results in economic loss to the water users.

The population at risk is approximately 359,000 people in the city of Bakersfield and the town of Lake Isabella. In the event of a dam failure there could also be significant damage to infrastructure in the area including: Interstate 5, Highways 99 and 58, major railroads lines, and the California state water project (supplies water to the Los Angeles metropolitan area).

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, are being applied as follows:

USFS Facilities Relocation Contract	\$ 6,000,000
Environmental Mitigation	4,600,000
Real Estate Condemnation	2,000,000
Phase II Engineering During Construction, Labor and Construction Management	11,900,000
Phase II Dams and Spillways Construction	40,882,000
Phase III Real Estate Acquisitions	65,000,000
Total	\$130,382,000

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

Phase II Dams and Spillway Construction	\$ 48,750,000
Phase II Engineering During Construction, Labor and Construction Management	8,900,000
Vegetation mitigation	350,000
 Total	 \$ 58,000,000

NON-FEDERAL COST: In accordance with the cost-sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsor must comply with the requirements listed below.

Requirements of Local Cooperation	Payment During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Reimburse 15 percent of the original cost share percentage of 21.7 percent of modification allocated to irrigation water supply (15% x 21.7%) or 3.255% of total project cost within a period of 30 years following completion of construction.	\$20,669,250	
Reimburse 15 percent of the original cost share percentage of 5.17 percent of modification allocated to hydroelectric power generation (15% x 5.17%) or 0.775% of total project cost within a period of 30 years following completion of construction.	\$4,921,250	
 Total Non-Federal Costs	 \$25,590,500	

STATUS OF LOCAL COOPERATION: There is an existing contract for local reimbursement of project costs (dated 23 October 1964) between the United States (Department of the Interior) and North Kern Water Storage District, Buena Vista Water Storage District, Tulare Lake Basin Water Storage District, and Hacienda Water District (hereinafter collectively known as the "Districts"). The total obligation payable by the Districts to the United States was \$4,573,000 for the total cost of the project allocated to irrigation, which amounted to 21.7% of the construction cost of the dam, at the time was \$22,000,000. North Kern Water Storage District was responsible for \$3,109,640 and Buena Vista Water Storage District for \$1,463,360.

The proposed non-Federal cost share for the Isabella Dam Safety Modification Project will be cost-shared at 15% of the original cost share percentage (15% x 21.7%) or 3.255%. It is anticipated that there will be a repayment contract for the remediation cost between the United States (Department of Interior) and the

Division: South Pacific

District: Sacramento

Isabella Dam, (Dam Safety), CA

Districts. Distribution of the 21% may remain the same as the original contract between the following two contractors, North Kern Water Storage District and Buena Vista Water Storage. The tentative date to have this draft repayment plan is the end of October 2017.

Additionally, the Cost Allocation Report published on 28 December 1955 found that “[p]ower accomplishments consist of improving the stream flow available at downstream power plants, incidental to the release of water for irrigation and flood control, thereby increasing the energy production at these plants.” Kern River power beneficiaries reimburse the United States for project costs pursuant to orders issued retroactively in 1954 by FERC under Section 10(f) of the Federal Power Act, at an initial cost share rate of 5.17%. Consistent with ER 1110-2-1156 dated 31 March 2014, fifteen percent (15%) of the cost of modifications required as a result of new hydrologic or seismic data shall be recovered in accordance with the cost sharing allocations in effect at the time of initial project construction. 0.775% of DSMP costs (15% of the 5.17% initially assigned to project power beneficiaries) will be assessed by FERC in future benefit assessment proceedings, resulting in a revised Federal cost share of 95.97% for DSMP costs. Coordination with FERC and the project’s power beneficiaries will begin upon the Headquarters, U.S. Army Corps of Engineers Dam Safety Officer’s concurrence and approval of the foregoing cost sharing allocation revisions.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$654,204,000 is a decrease of \$26,567,000 from the last estimate presented to Congress (FY 2017).

Item	Amount
Design refinement and estimating adjustments	(\$26,567,000)
Total	(\$26,567,000)

The cost to relocate the USFS office and recreation facilities was not included in the 2012 DSMR cost estimates. There was no authority to relocate those facilities at that time. A cost estimate for 95% design was completed in March 2016.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: An Environmental Impact Statement (EIS) was included in the DSMR; the EIS and ROD were signed in December 2012 following public review. Additional National Environmental Policy Act documents will be provided during the design efforts to address real estate actions, recreation and fisheries.

OTHER INFORMATION: Isabella Dam was placed in operation and became fully operational in 1953. The project was funded under the Dam Safety Assurance, Seepage Control, and Static Instability Correction Program (Dam Safety Program) from FY 2007 to FY 2013. The Dam Safety Modification Report was signed in December 2012 and the PED phase was initiated in FY 2013.

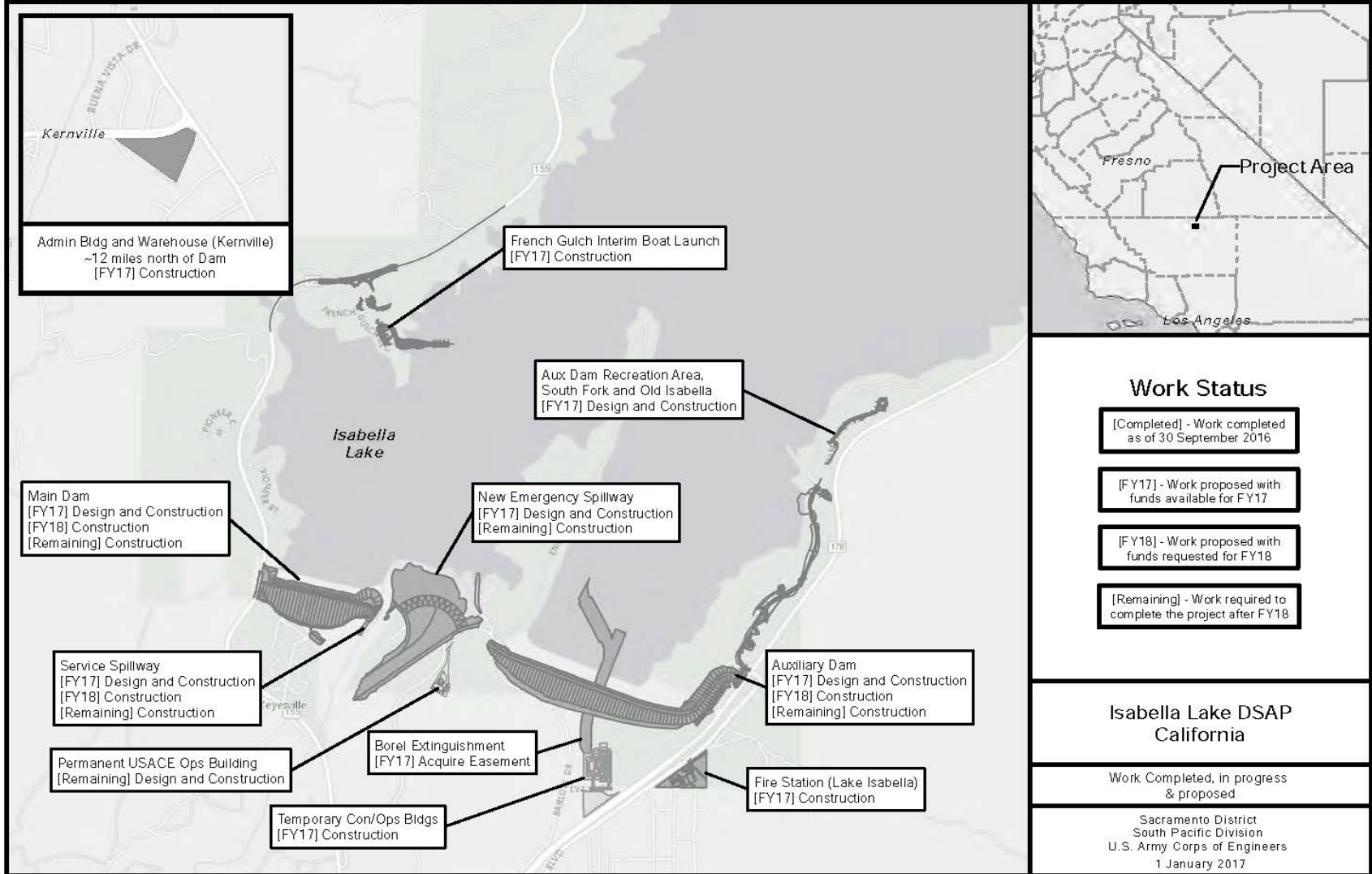
The relocation of Highway 178 was to be initiated in FY 2014. A portion of the FY 2014 funds were originally planned to be used for relocation of private residences and the USACE project facilities; however, a redesign of the Auxiliary Dam left abutment eliminated the requirement for Highway 178 to be relocated. Due to high cost and degree of construction difficulty, the USACE has determined that a preferred strategy is to redesign the right abutment of the Main Dam along Highway 155 instead of relocating and reconstructing the highway.

The USACE is constructing replacement recreation facilities for USFS with completion scheduled for FY 2017.

Division: South Pacific

District: Sacramento

Isabella Dam, (Dam Safety), CA



APPROPRIATION TITLE: Construction – Flood Risk Management, Fiscal Year 2018

PROJECT: Sacramento River Bank Protection Project, California (Continuing)

LOCATION: The Sacramento River Bank Protection Project (SRBPP) is a work activity on the Sacramento River Flood Control Project (SRFCP), which is located in north-central California, along the Sacramento River and its principal tributaries, approximately from Sacramento River, River Mile (RM) 0 near Collinsville to RM 194 near Chico Landing, including Deer Creek and Elder Creek. The SRFCP includes Butte Basin, Cache Slough, and a portion of the Sacramento-San Joaquin Delta slough, and extends through eight counties including Tehama, Glenn, Butte, Colusa, Sutter, Yolo, Solano, and Sacramento.

DESCRIPTION: Under the SRBPP, the U.S. Army Corps of Engineers has been constructing bank protection to reduce the risk that a levee will fail due to erosion; it also includes fish and wildlife mitigation features. The overall bank protection project consists of an authorized 915,000 lineal feet, split into two phases. Phase I, completed in 1978, included the first 430,000 lineal feet authorized in 1960. Phase II, funded to completion in FY 2017, includes 405,000 lineal feet authorized in 1974 and an additional 80,000 lineal feet authorized in 2007. Some recreational facilities have been provided along the river. The non-Federal sponsor is the State of California's Central Valley Flood Protection Board (CVFPB). The total estimated cost of the project is \$391.813 million and is shared 72 percent Federal and 28 percent non-Federal.

The SRFCP consists of 1,125 miles of levees plus overflow weirs, pumping plants, and bypass channels along the Sacramento River from River Mile (RM) 0 near Collinsville to RM 194 near Chico, including several sloughs and the lower reaches of major tributaries. The Sacramento River levee system was initiated as a purely local project. For most of the system the levees were constructed close to the riverbanks without a protective berm. The design of a levee system close to the riverbank was intended at that time to reduce the distance between the levees, in order to help move sediment from hydraulic mining through the system more quickly. The then existing levee system was authorized as the SRFCP in 1917. It has been modified and expanded several times since that date but no major change in the basic levee alignment has been made since the original conception of the project, which predates 1917.

Of forty-five basins, to date, improvements in seven basins have been found to be feasible. The seven basins are: Butte, Natomas, Sacramento, Southport, Sutter Island, West Sacramento, and Yolo. Butte Basin is located in the northern part of the Central Valley. The basin is bordered on the west side by the Sacramento River, from RM 142 to 200; on the north side by Mud and Chico Creeks; on the east side by the Butte Sink and Sutter Buttes; and on the south side by the Butte Slough levee. The basin is primarily agriculture (rice, orchards, and field crops) with a few small towns and the city of Chico (population 86,000). The Natomas Basin is located in the middle of the northern Central Valley, just north of downtown Sacramento. The basin is bordered on the west side by the Sacramento River, from RM 61 to 81; on the north side by the Natomas Cross Canal; on the east side by the Natomas East Main Drainage Canal and the Pleasant Grove Canal; and on the south by the American River, RM 0 to 2. The basin is a mix of urban and agriculture; it contains a portion of the population of Sacramento (including the Sacramento International Airport). The Sacramento Basin is located in the middle of the northern Central Valley. The basin is bordered on the west side by the Sacramento River, from RM 46 to 60; on the north side by the American River, RM 0 to 11; on the east side by high ground; and on the south side by the Morrison Creek levees. The basin is primarily urban with the City of Sacramento (population 470,000) and the rural urban areas of Sacramento County (total urban area population of 1.4 million). The Southport Basin is located in the middle of the northern Central Valley. The basin is bordered on the north and west side by the Sacramento Deep Water Ship Channel; on the east by the Sacramento River, RM 51 to 57; and on the south side by the South Cross levee. The basin is a mix of urban and agriculture; the urban area consists of a large portion of the City of West Sacramento (population 48,700). The Sutter Island Basin is located in the middle of the Central Valley at the north end of the Delta. The basin is an island bordered entirely by levees; it is bordered on the north and west by Sutter Slough, RM 22 to 28; on the east by the Sacramento River, RM 32 to 34; and on the south by Steamboat Slough, RM 22 to 26. The basin is entirely

Division: South Pacific

District: Sacramento

Sacramento River Bank Protection, CA

agricultural, with the majority of the land occupied by vineyards and orchards (cherry and pear trees). The West Sacramento Basin is located in the middle of the northern Central Valley. The basin is bordered on the north and east sides by the Sacramento River, RM 57 to 63; on the north by the Sacramento Bypass; on the south by the Sacramento Deep Water Ship Channel; and on the east by the Yolo Bypass. The basin is primarily urban with a large portion of the City of West Sacramento occupying almost the entire basin. The Yolo Basin is located in the middle of the northern Central Valley. The basin is bordered on the north and west sides by high ground, on the north and east sides by the Knights Landing Ridge Cut; on the southwest side by the Yolo Bypass, and on the south side by Cache Creek. The basin is primarily agriculture (field crops, grain, nursery, and berry crops) and includes the small town of Yolo (population 450).

All work is programmed.

AUTHORIZATION: Flood Control Act of 1960, Pub. L. 86-645, § 203, 74 Stat. 488, 498 (1960) (Phase I); River Basin Monetary Authorization Act, Pub. L. 93-252, §202, 88 Stat. 49 (1974); Further Continuing Appropriations Act, Pub. L. 97-377, §140, 96 Stat. 1916 (1983); Water Resources Development Act (WRDA) of 1986, Sec. 601 (a); Water Resources Development Act of 2007, Pub. L. 110-114, § 3031, 121 Stat. 1041, 1113 (2007) (Phase II).

REMAINING BENEFIT-REMAINING COST RATIO: 44.6 to 1 at 7 percent discount rate.

TOTAL BENEFIT-COST RATIO: 44.6 to 1 at 7 percent discount rate (seven basins)

INITIAL BENEFIT-COST RATIO: N/A (see OTHER INFORMATION)

BASIS OF BENEFIT-COST RATIO: 2011 Economic Update and addendum, dated 31 October 2011 at October 2010 price levels. Only 21 out of the 45 basins were looked at; only seven of the 21 impact areas are economically justified at an interest rate of 7 percent (Butte, Natomas, Sacramento, Southport, Sutter Island, West Sacramento, and Yolo).

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Phase I(1963-1978)				Bank Protection	100	1975
Estimated Federal Cost			\$ 35,607,000	Recreation	100	1975
Estimated Non-Federal Cost			17,777,000			
	Cash Contribution	\$9,192,000				
	Other Costs	8,585,000				
Total Phase 1			\$ 53,384,000			
Phase I Mitigation				Bank Protection	100	2001
Estimated Federal Cost			\$ 1,336,000	First Ph., 430,000		
Estimated Non-Federal Cost			784,000	lineal feet	100	1975
	Cash Contribution	\$ 367,000		Pine Creek Unit	100	2001
	Other Costs	417,000		Shaw Unit	100	1999
Total Phase I Mitigation			\$ 2,120,000	River Unit	100	1994
Phase II (1978-1987)				Sam Slough	100	1999
Estimated Federal Cost			\$ 25,928,000	Lohman	100	1997
Estimated Non-Federal Cost			12,944,000	Princeton Ferry	100	1996
	Cash Contribution	\$10,271,000				
	Other Costs	2,673,000				
Total Phase II (1978-1987)			\$38,872,000			

Division: South Pacific

District: Sacramento

Sacramento River Bank Protection, CA

SUMMARIZED FINANCIAL DATA (Continued)			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Phase II (1988-2006)						
Estimated Federal Cost		\$ 96,553,000				
Estimated Non-Federal Cost		32,240,000		Sep Element 38B	100	1987
Cash Contribution	\$29,100,000			Sep Element 40	100	2002
Other Costs	3,140,000			Sep Element 42	100	2006
				Sep Element 41	100	2001
Total Phase II (1988- 2006)		\$128,793,000				
Phase II Continuing						
Estimated Federal Cost		\$122,567,000		Bank Protection	99	TBD
Estimated Non-Federal Cost		60,369,000		PACR for 80K LF	80	2017
Cash Contribution	\$38,745,000					
Other Costs	21,624,000					
Total Phase II Continuing		\$182,936,000				
Project Summary						
Estimated Federal Cost		\$281,991,000		Entire Project	91	TBD
Estimated Non-Federal Cost		124,114,000				
Cash Contribution	\$87,675,000					
Other Costs	36,439,000					
Total Estimated Project Cost		\$406,105,000				
Authorized Cost (plus inflation)		N/A				
Maximum Cost Limit (Section 902)		N/A				

Division: South Pacific

District: Sacramento

Sacramento River Bank Protection, CA

SUMMARIZED FINANCIAL DATA (Continued)		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Allocations to 30 September 2014	\$251,626,000				
Allocation for FY 2015	2,500,000				
Allocation for FY 2016	6,000,000				
Allocation for FY 2017	8,000,000				
Allocations through FY 2017	268,126,000	1/2/3/5/	95		
Estimated Unobligated Carry-In Funds	6,490,000	4/			
President's Budget for FY 2018	2,780,000		96		
Programmed Balance to Complete after FY 2018	11,085,000				
Un-programmed Balance to Complete after FY 2018	0				

1/ \$5,568,998 reprogrammed from the project.

2/ \$131,727 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding. The actual unobligated carry-in from FY 2016 to FY 2017 was \$3,186,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$6,490,000.

5/ PED costs of \$0 are included in this amount.

PHYSICAL DATA: The SRBPP consists primarily of repairs to the banks of the Sacramento River and its tributaries to address erosion, and bank stabilization. The work typically consists of placing appropriately sized rock to stop erosion in problem areas, but setback levees are also authorized and have been constructed. These problem areas are identified through annual inspections of the riverbanks. To date, 915,000 lineal feet have been authorized for repair.

JUSTIFICATION: Bank protection is an ongoing effort on this levee system. Since the time that the remains of hydraulic mining have moved through the river system, it is now sediment starved, and the levees are continuously threatened by erosion. Unless corrective measures are taken, levee breaches may occur with resultant catastrophic damage and possible loss of life. The area behind the levees comprises over one million acres in which about 50 communities are located.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be applied as follows:

Continued mitigation for previously constructed repairs, ongoing biological monitoring, O&M manual updates, and notices of completion.	\$ 500,000	
Levee/bank erosion inventory within the SRFCP limits and subsequent designs, contract development, award and administration for needed erosion repairs and associated mitigation; NEPA/CEQA documentation and compliance.	4,100,000	
Supervision and Administration	3,186,000	
Total	\$ 7,786,000	4/

FISCAL YEAR 2018: The budget amount, plus carry-in funds, will be applied as follows:

S&A for erosion repairs construction contracts awarded in prior years	\$ 690,000	
Mitigation, monitoring and reporting for Endangered Species Act compliance	1,600,000	
O&M manual updates and notices of completion	750,000	
Award construction and mitigation contracts	6,490,000	
Total	\$ 9,270,000	4/

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsor must comply with the requirements listed below.

	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Requirements of Local Cooperation		
Provide lands, easements, rights of way, and borrow and excavated or dredged material disposal areas.	\$ 21,480,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	667,000	
Pay 17.2 percent of the total cost of Phase I (1963-1978) to bring the total non-Federal share of flood control costs to 33.3 percent and bear all costs of operation and maintenance repair, rehabilitation and replacement of flood control facilities.	9,192,000	
Pay 17.3 percent of the total cost of Phase I Mitigation to bring the total non-Federal share of costs of Phase I Mitigation to 37 percent for work performed, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of this functional portion of the project.	367,000	
Pay 26.4 percent of total cost of Phase II (1978-1987) to bring the total non-Federal share of flood control cost to 33.3 percent.	10,271,000	
Pay 29.2 percent of the total cost of Phase II (1988-2006) to bring the total non-Federal share of flood control costs to 25 percent and bear all costs of operation and maintenance repair, Rehabilitation and replacement of this functional portion of the project.	29,100,000	\$ 205,000
Pay 24 percent of the costs allocated to flood control to bring the total non-Federal share of flood control costs to one-third for Phase II Continuing work and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood control facilities.	38,745,000	1,174,000
Total non-Federal Costs	\$109,822,000	\$1,379,000

The non-Federal sponsor has agreed to make all required payments concurrently with project construction.

Division: South Pacific

District: Sacramento

Sacramento River Bank Protection, CA

STATUS OF LOCAL COOPERATION: Chapter 2188, Statutes of the State of California, approved by the Governor on July 21, 1961, established the State Reclamation Board (Board) as the agency to meet the requirements of local cooperation for the project. Assurances of local cooperation were accepted from the Board on February 5, 1963. The Board signed a Local Cooperation Agreement (LCA) for the remaining Phase II work in May 1984, satisfying the requirements of Section 221, Flood Control Act of 1970 (Public Law 91-611). In accordance with provisions of the Water Resources Development Act of 1986 for separable project elements initiated after April 30, 1986, new LCAs have been executed in the past for other separable elements. The State of California provided accelerated funds with the aid of a LCA amendment, executed May 5, 2006, allowing the project to accept funds ahead of the cost share balance, so that work on the sites may proceed unimpeded. In 2007, the California legislature restructured the Board and renamed it the Central Valley Flood Protection Board. The non-Federal sponsor continues to support all phases of this project. The Project Partnership Agreement for the additional authorized 80,000 lineal feet, which were funded to completion in FY 2017, will be developed in FY 2017 and executed in FY 2018.

The current non-Federal cost estimate of \$124,114,000 is an increase of \$1,614,000 from the latest estimate (\$122,500,000) presented to Congress (FY 2017).

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$281,991,000 is an increase of \$3,151,000 from the latest estimate (\$278,840,000) presented to Congress (FY 2017). This change includes the following:

Item	Amount
Post contract Award and Other Estimating Adjustments	\$3,151,000
Total	\$3,151,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: A final Environmental Impact Statement (EIS) was filed on June 15, 1973. A Supplemental Environmental Impact Statement (SEIS) for the second phase was filed in February 1989. A final EIS for additional work in Butte Basin and an update submitted as Supplement 4 were signed in June 1988. An Environmental Assessment/Site Specific Report (EA/SSR) was prepared for Contract 42A and a Finding of No Significant Impacts (FONSI) was signed on February 15, 1994. An EA/SSR was prepared for contracts Lower American River sites 3 and 40D and FONSI were signed July 2, 1996 and September 3, 1997, respectively. A Supplemental Design Memorandum No. 8 was prepared for sites along the lower American River and the SEIS was completed in April 1998. Currently, an environmental document such as an EA/SSR to meet both Federal and State of California requirements is approved prior to construction of each bank protection contract. An EA for bank protection at 13 erosion sites was developed in 2008. Another EA for up to 25 sites was approved in June 2009. A programmatic EIS to support the Limited Reevaluation Report for the additional 80,000 LF authorized in WRDA 2007 and funded to completion in FY 2017, was reviewed by the public and external agencies in early 2015, and is expected to be finalized in FY 2017. The fish and wildlife mitigation cost is estimated at \$31,000,000.

The United States Fish and Wildlife Service (USFWS), by letter dated November 7, 1985, issued a Biological Opinion (BiOp) stating that the bank protection work along the Sacramento River from Chico Landing to Red Bluff and in the Butte Basin area would endanger the threatened valley elderberry longhorn beetle. The USFWS issued a revised BiOp on May 19, 1987 that permitted limited rock revetment bank protection to be constructed in the Butte Basin. The potential impact to winter-run salmon has also been a significant concern as the winter-run salmon have experienced an alarming decline since 1969. The National Marine Fisheries Service (NMFS) listed winter-run salmon as a threatened species in November 1990. The winter-run salmon biological data report was completed January 1991. The NMFS BiOp dated October 28, 1991 for the winter-run salmon was non-jeopardy but lists recommended conservation measures. Winter-run salmon, along with bank swallows and Swainson's Hawk, are also State-listed species. A BiOp was received from California Department of Fish and Game on November 18, 1991 which also recommended conservation measures.

Division: South Pacific

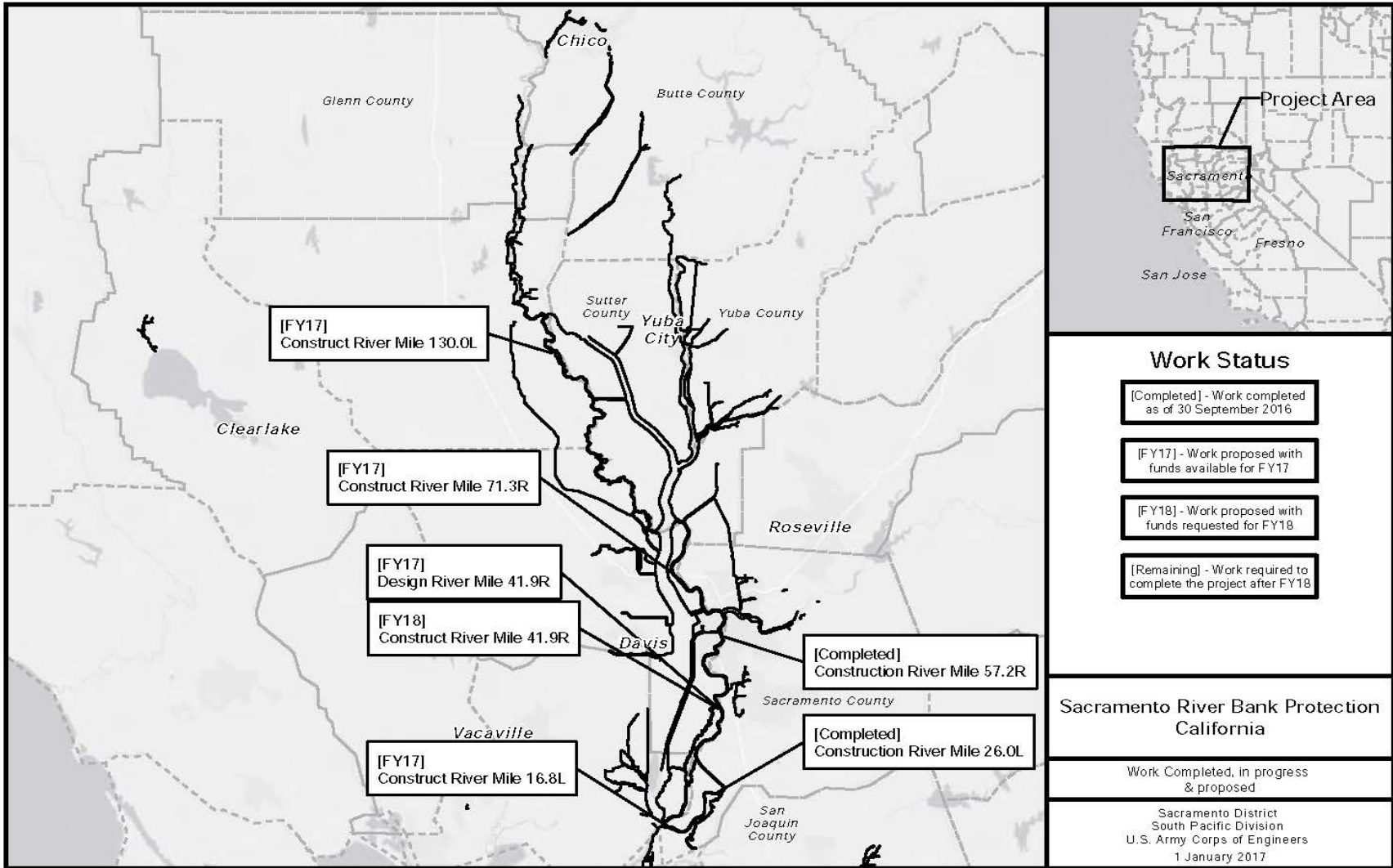
District: Sacramento

Sacramento River Bank Protection, CA

On August 23, 2001, the USFWS issued its final BiOp on the SRBPP. The NMFS released their BiOp on September 27, 2001. Both BiOps were virtually identical in terms of identifying the SRBPP's effects as jeopardizing the existence of five fish species (Delta smelt, Sacramento splittail, winter-run Chinook salmon, spring-run Chinook salmon, and Central Valley steelhead) listed under the Endangered Species Act in the Sacramento River. With recent collaborative efforts, most repair sites have been self-mitigating. In December 2006, NMFS issued a programmatic BiOp with terms and conditions for a limited amount of take of protected species and critical habitat. In June 2008, the USFWS issued its programmatic BiOp that similarly imposes terms and conditions for limited take. Subsequent amendments and site-specific consultations have followed from these programmatic BiOps. The most recent ESA consultations include new requirements for managing and monitoring impacts to green sturgeon.

OTHER INFORMATION: The Flood Control Act of 1960 (PL 86-645, Sec. 203) authorized an initial phase of bank erosion control works and setback levees for the SRFCP. Funds to initiate preconstruction planning were appropriated in FY 1962, and for construction in FY 1963. Construction of the first phase was completed in November 1974. Authority to proceed with additional bank protection work, second phase, was provided by Section 202, River Basin Monetary Authorization Act of 1974, Public Law 93-251. The Further Continuing Appropriations Act of 1983, Public Law 97-377, extended the limits of the project to include bank protection along the Sacramento River to the upstream ends of the project levees to Chico Landing (Butte Basin area). The Water Resources Development Act of 1986 modified the first phase of the project to include acquisition of lands for establishment and maintenance of wildlife habitat at a total cost of \$1,410,000 (\$1,837,176 inflated through construction). The last parcel was acquired in FY 1997. Monitoring of fish and wildlife habitat and engineering features continues at each site.

The Investigations account includes funding for a General Reevaluation Report (GRR) for the SRBPP. Since the initial bank protection contract was let in June 1963, about 837,462 lineal feet of bank protection has been provided. Approximately an additional 83,491 lineal feet of bank protection, including the 80,000 lineal feet authorized by WRDA 2007, are authorized. The purpose of this GRR is to evaluate options for additional modifications to improve system integrity and resilience within the Sacramento River Flood Control Project footprint. The Department of the Army and the State of California, the non-Federal sponsor, executed a Feasibility Cost-Sharing agreement in FY 2015.



Work Status

- [Completed] - Work completed as of 30 September 2016
- [FY17] - Work proposed with funds available for FY17
- [FY18] - Work proposed with funds requested for FY18
- [Remaining] - Work required to complete the project after FY18

Sacramento River Bank Protection California

Work Completed, in progress & proposed

Sacramento District
 South Pacific Division
 U.S. Army Corps of Engineers
 1 January 2017

APPROPRIATION TITLE: Construction - Local Protection (Flood Risk Management), Fiscal Year 2018

PROJECT: Santa Ana River Mainstem, California (Continuing)

LOCATION: The project is located along a 75-mile reach of the Santa Ana River in Orange, Riverside, and San Bernardino Counties, southeast and adjacent to metropolitan Los Angeles, California.

DESCRIPTION: The project includes seven distinct elements:

- 1) construction of the Seven Oaks Dam about 35 miles upstream of the existing Prado Dam, with a gross reservoir storage of 145,600 acre feet (completed in 1999);
- 2) enlargement of Prado Dam to increase the reservoir storage capacity from 217,000 acre-feet to 362,000 acre-feet. Construction of the Alcoa Dike is required before the Prado Spillway can be raised and the Prado Dam project completed;
- 3) construction of 3.3 miles of channel modifications along Oak Street Drain in Corona (completed in 1996);
- 4) enlargement of the existing 2.4 miles of Mill Creek levee (completed in 1992);
- 5) construction of a detention basin and 2.0 miles of channel modifications along the Santiago Creek;
- 6) various measures along the 30.5 miles of the Lower Santa Ana River from Prado Dam to the Pacific Ocean including flood plain management, levees, and vertical walled concrete channels. These measures are in 10 Reaches. Reaches 1-8 and 10 were completed in 2011. Phases 1, 2A, 2B, and 3 of Reach 9 were completed in 2015. Phase 4, 5A of Reach 9 and the Federal construction of the Santa Ana River Interceptor (SARI) line were completed in 2016. The non-Federal sponsor will complete their Riverside portion of the SARI line in FY 2017;
- 7) various measures along San Timoteo Creek; Remaining unconstructed portions of this project are Reach 9 of the Lower River (Phase 5B and Burlington Northern Santa Fe (BNSF) railroad bridge protection), Prado Dam spillway, Alcoa dike, River Road dike, Norco Bluffs bank protection and Santiago Creek. The River Road dike is the recommended alternative from a value engineering proposal prepared by Orange County, which consists of the construction of an earthen dike 4,500 feet in length, ranging in height from 0 to 7 feet and up to 14 feet for a short distance. The River road floodwall was identified in a 1998 value engineering study and Orange County proposed a 6-ft high flood wall along the westerly side of River Road, between Bluff Street and Trail Street, as being more economical than real estate acquisition to reduce the risk of flood damages to 8 properties from the 190-year reservoir design flood. Construction of this feature is also needed for the proper function of six (6) separate storm drain systems that serve the adjacent residential developments. The dike and floodwall would be located in the Northeast portion of the Prado Basin, between Chandler Street toward the north end and Oosten Farms Road at the South end with portions along Hall Avenue, in the city of Eastvale.

Division: South Pacific

District: Los Angeles

Santa Ana River Mainstem, CA

Mitigation is required, per agreement with the U.S. Fish and Wildlife Service (USFWS) for Seven Oaks Dam, San Timoteo, Lower Santa Ana River, and Prado Dam. The estimated fish and wildlife mitigation cost for Seven Oaks Dam is \$10 million, for San Timoteo is \$5 million, for Lower Santa Ana is \$28 million and for Prado Dam is \$18 million.

The estimated cost of Lands, Easements, Rights of Ways, Relocations and Disposals (LERRD) for the Prado Dam separable element is above 45 percent of the estimated cost of Prado Dam that is allocable to flood control. If this remains the case upon completion of the Prado Dam and final accounting, the government is authorized under WRDA 1986, subject to availability of funds, to reimburse the Non-Federal sponsor for any such value in excess of 45 percent to bring the ultimate cost sharing to 50 percent Federal and 50 percent Non-Federal for the Prado Dam Project.

AUTHORIZATION: Water Resources Development Act of 1986, Energy and Water Development Appropriation Act, 1988, Water Resources Development Act of 1990, Water Resources Development Act of 1996, and Water Resources Development Act of 2007.

REMAINING BENEFIT-REMAINING COST RATIO: 4.36 to 1 at 7 percent discount rate.

TOTAL BENEFIT-COST RATIO: 2.05 to 1 at 7 percent discount rate.

INITIAL BENEFIT-COST RATIO: 1.3 to 1 at 8 5/8 percent (FY 1988)

BASIS OF BENEFIT-COST RATIO: The benefit-cost ratio is based on a July 2013 Level III Limited Re-evaluation Report.

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PERCENT COMPLETE	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost		\$1,555,735,000	Seven Oaks Dam	100	November 1999
Programmed Construction	1,435,900,000		Prado Dam	65	December 2024
Unprogrammed Reimbursement	119,835,000		Santiago Creek	10	December 2026
LERRD	83,260,000 <u>7/</u>		Mill Creek	100	April 1992
Judgment Fund	36,575,000 <u>8/</u>		Oak Street Drain	100	January 1996
Lwr SAR Rch 9 & SARI Line				85	October 2021
Estimated Non-Federal Cost		\$860,765,000	Lower Santa Ana Rch 1-8,10	100	July 2011
Programmed Construction	\$860,765,000		Marsh	100	November 2013
Cash Contributions	\$120,825,000		San Timoteo	100	November 2007
Other Costs	\$823,200,000				
LERRD Reimbursement	(\$83,260,000)		Total Project	80	FY 2029
Total Estimated Programmed Construction Costs		\$2,296,665,000			
Total Estimated Project Cost		\$2,416,500,000			
Authorized Cost (plus inflation)	\$2,181,078,000				
Maximum Cost Limit (Section 902)	\$2,540,929,000				

Allocations to 30 September 2014	\$1,093,842,000			
Allocation for FY 2015	\$55,826,000			
Allocation for FY 2016	\$28,500,000			
Allocation for FY 2017	\$49,000,000			
Allocations through FY 2017	\$1,227,168,000	1/2/3/5/	85	
Estimated Unobligated Carry-In Funds	\$300,000	4/		
President's Budget for FY 2018	\$40,000,000		88	
Programmed Balance to Complete after FY 2018	\$168,732,000	6/		
Un-programmed Balance to Complete after FY 2018	\$119,835,000			

1/ \$1,250,000 reprogrammed to project.

2/ \$250,000 rescinded from the project.

3/ \$2,014,139 transferred to the Flood Control & Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$34,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$300,000.

5/ PED Costs of \$26,890,000 are included in this amount.

6/ For programmed work only, remaining items are un-programmed pending specified funding for reimbursement.

7/ Includes estimated reimbursement to sponsor for LERRD over 45 percent on the Prado Dam separable element as authorized by WRDA 1986.

8/ Includes Federal portion of reimbursement for a total of \$38,500,000 owed to Treasury Judgment fund for a contract claim on the Seven Oaks Dam feature.

Division: South Pacific

District: Los Angeles

Santa Ana River Mainstem, CA

PHYSICAL DATA:

SEVEN OAKS DAM:

Dam: Type - Impervious core
Height - 550 feet
Length - Crest Length 2,980 feet
Outlet Works: Gated conduit, 8,000 cfs maximum discharge
Basin Capacity: 145,600 acre-feet
Spillway: Type - Detached overflow, 500 ft wide, unlined
Embankment: Earth and Rock fill
Lands & Damages: Acres - 2,736 existing streambed and undeveloped (mountainous)
Water Quality Study

MILL CREEK:

Levee repair: Type - Grouted riprap
Height - 10 feet maximum
Length - 12,500 feet (2.4 miles)
Floodwall (Top of levee): Type – Concrete
Height - 7.5 feet maximum
Length - 12,500 feet (2.4 miles)

OAK STREET DRAIN:

Channel: Rectangular concrete 3.0 mile
Trapezoidal riprap 0.3 miles
Lands & Damages: 34 acres for rights-of-way

SAN TIMOTEO CREEK:

Channel: 5.4 miles trapezoidal concrete
Basins: 18 in-channel and transition chute
Lands & Damages: 60.3 acres for rights-of-way

JUSTIFICATION: The project will provide additional flood risk reduction for portions of three major metropolitan areas: Orange, San Bernardino and Riverside counties, however, these additional benefits are primarily to lands and improvements within Orange County, downstream of Prado Reservoir. A large flood that exceeds the carrying capacity of the existing project features (prior to the improvements now underway) could affect up to approximately 1.1 million residents and cause damage to up to nearly 300,000 structures with an estimated value of \$100 billion. Without project equivalent annual damages are estimated at over \$400 million. Over 90 percent of these damages would occur to properties downstream of the Prado reservoir. The overflow area comprises 160 square miles of

Division: South Pacific

District: Los Angeles

Santa Ana River Mainstem, CA

SANTIAGO CREEK:

Channel: Rectangular concrete 500 feet; Trapezoidal riprap 2.0 miles
Reservoir: Buttressed Basin
Capacity: Flood control 4,620 acre-feet (el. 274 to 298)
Lands and Damages: 281.5 acres, reservoir and channel

PRADO DAM:

Dam: Type - Impervious core
Height - 134 feet
Length - 3,050 crest length
Outlet Works: Gated conduits
30,000 cfs maximum discharge
Embankment: Rolled earth fill
Spillway: Type - Detached, overflow concrete, 1,000 feet wide,
578,000 cfs maximum design discharge.
Basin Capacity: 362,000 acre-feet
Interior Basin Dikes: 8

LOWER SANTA ANA RIVER:

Channel: - 200-450 feet wide,
34 bridges replaced or modified
Relocate sewage and brine line (SARI) Santa Ana River Interceptor Line
- 5.0 miles trapezoidal concrete
- 2.4 miles rectangular concrete
- 15.5 miles trapezoidal grouted riprap
- 0.8 miles rectangular concrete/soft bottom
Lands & Damages: Acres - 2,429.5 for channel (7.4 miles floodway)
Mitigation Lands: Acres – 8 marshland
Enhancement Lands: Acres - 84 marshland enhancement

primarily urban development in 15 cities including San Bernardino, Riverside, Anaheim, Orange, Santa Ana, Fountain Valley, Costa Mesa, Huntington and Newport Beach. The flood of 1938 is the largest that has been recorded since accurate stream gages were placed in the Prado basin. With a peak flow at Riverside Narrows of approximately 100,000 cubic feet per second (cfs), the flood covered thousands of acres of then predominantly rural Orange County. Following this storm, the U.S. Army Corps of Engineers constructed Prado Dam at the head of the Santa Ana Canyon to reduce the risk of flood damage for much of the downstream basin. Prior to the improvements now being constructed under the Santa Ana River Mainstem project, the annual chance of flooding (or annual exceedance probability (AEP)) downstream of Prado, primarily in Orange County, is approximately 1.4% (or a “70 year event”). With these improvements, the AEP downstream of Prado would be reduced to about 0.53% (or a “190 year event”).

Once completed the Alcoa Dike will reduce the risk of flood damages to industrial business buildings and structures located Southeast of West Rincon Road, along the Southeast section of the Prado Reservoir in the city of Corona. An Alcoa Aluminum plant is located just outside of the existing rights of way in the southeastern part of the Prado reservoir. The entire plant (plus other privately owned development) is located within the proposed reservoir taking line at elevation 566. Support studies indicated that it would be more economical to construct a dike around these properties than to acquire them as part of the Prado Dam project. The designed alignment of the dike will minimize impacts on existing facilities such as streets, utilities, sludge drying beds, and other industrial and commercial development.

Construction of the River Road dike will eliminate the need for acquisition of 67 acres of real estate.

The work on Reach 9 of the Lower River will reduce the risk of flood damages in the highly urbanized lower Santa Ana River basin. Areas of the Reach 9 channel known as the Burlington Northern Santa Fe (BNSF) Railway bridge, Phase 4 (Reinforce embankment Coal Canyon) and Phase 5 (Reinforce embankment Yorba Linda) were identified as requiring scour protection from the designed Prado dam releases of 30,000 cfs. Operation of Prado dam at the design level is contingent upon completing the Reach 9 channel improvements and the Santa Ana River Interceptor (SARI) line relocation. A scour study was completed in 2011 as an engineering investigation in relocating the SARI Line in the Orange County portion of the Santa Ana River. This study was more detailed than previous studies due to the need to determine more accurate scour elevations for the SARI Line. The new analysis indicates a more aggressive scour and river channel degradation rate than previous studies calculated when the General Design Memorandum for the Reach 9 features was completed (1988). A review of Reach 9 flood and scour protection measures was undertaken to ensure infrastructure adjacent to Reach 9 would not be damaged by flood waters released from Prado Dam in the design flood event (30,000 cfs). The recent analysis indicated that the existing embankment protection and toe depth elevations at the locations identified as Phases 4 and 5 would not be sufficient and would need additional embankment reinforcement. Once completed, the designed releases will reduce flow over the spillway, preventing a probable maximum flood from eroding the side walls and causing major damage to the surrounding communities. The lower Santa Ana River 500-year floodplain is centered over the most densely populated and urbanized portion of Orange County that has the 10th largest industrial office and warehouse market in the United States with over 271 million square feet of space and less than 4 percent vacancy rate.

Reach 9 Phase 5 spans an area nearly 2 miles long through sensitive habitat. These habitats are occupied by up to three federally listed threatened or endangered species. Estimated mitigation costs reflect estimated impacts, both permanent and temporary, to riparian, upland, and perennial stream communities and expected compensation ratios or multipliers. Preliminary investigations have shown that the majority of expected impact zones in the project area are characterized as riparian, which has the highest mitigation ratio, and perennial stream, which has a 1:1 mitigation ratio but an extremely high per unit cost.

Local and State agencies have created a joint powers authority, the Santa Ana Watershed Project Authority that have developed a prioritized list of State and locally funded projects for the watershed. In developing the Santa Ana watershed pilot budget, many of the stakeholders have indicated that completion of Reach 9 is required prior to the initiation of a majority of the non-Federally funded projects in the watershed. Until Reach 9 is completed, a major storm event requiring

large releases from the dam could cause major damages along the unprotected areas of Reach 9, which would further delay the completion of Reach 9 and the ability of Prado Dam to operate at the design level of 30,000 (cfs).

Average annual benefits at a 7 percent discount rate are as follows:

Annual Benefits	Amount
Flood Damage Reduction	\$361,580,000
Total	\$361,580,000

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be applied as follows:

Construction Management, Supervision & Administration, Engineering & Design and mitigation efforts for the ongoing Reach 9 contracts	\$7,784,000
Award Reach 9 BNSF Railroad Bridge Protection Contract	33,000,000
Award Drilling Services Contract	500,000
Award Auxilliary Dike & Floodwall Connector Contract	2,500,000
Prado Dam Sediment Transport/Geomorphology Study for Santa Ana sucker fish	1,000,000
Fish Translocation	1,800,000
Economic Evaluation Update	150,000
Ongoing contract modifications	2,000,000
Total	\$48,734,000

FISCAL YEAR 2018: The budget amount plus carry-in funds will be applied as follows:

Construction Management, Supervision & Administration, Engineering & Design and mitigation efforts for existing contracts	\$ 8,300,000
Award Alcoa Dike Construction contract	14,000,000
Award River Road Dike & Floodwall construction contract	18,000,000
Total	\$40,300,000

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsors must comply with the following requirements listed below.

Payments	Annual Operation, Maintenance,
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Requirements of Local Cooperation and Project Cooperation	During Construction And Reimbursements	Repair, Rehabilitation and Replacement Costs
Santa Ana River Mainstem:		
Provide lands, easements, rights-of-way, and borrow, excavated or dredged material disposal areas.	\$ 149,300,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	181,500,000	
Pay 5 percent cash of the costs allocated to flood control to bring the total non-Federal share of flood control costs to 31 percent, and bear all cost of operation, maintenance, repair, rehabilitation and replacement of flood control facilities.	75,365,000	\$ 2,300,000
Prado Dam (Separable Element):		
Provide lands, easements, rights-of-way, and borrow, excavated or dredged material disposal areas.	423,400,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	69,000,000	
Pay 5 percent cash of the costs allocated to flood control to bring the total non-Federal Share of flood control costs to 50 percent, and bear all costs of operation, maintenance, Repair, rehabilitation and replacement of flood control facilities.	45,460,000	200,000
Estimated reimbursement to local sponsor for LERRDS in excess of 45 percent of total project costs for flood control, subject to availability of funds.	(83,260,000)	
Total Non-Federal Costs	\$860,765,000	\$2,500,000

The non-Federal sponsors have also agreed to make all required payments concurrently with project construction.

STATUS OF LOCAL COOPERATION: Orange, San Bernardino, and Riverside Counties are the local sponsors. On 14 December 1989, the Local Cooperation Agreement (LCA) was executed in compliance with the requirements of the Water Resources Development Act of 1986. A supplemental LCA was executed on July 1, 1994 for San Timoteo Creek. On June 30, 1997, the Assistant Secretary of the Army for Civil Works approved Prado Dam as a separable element and provided direction to proceed in accordance with Section 309 of the Water Resources Development Act of 1996 to modify the existing LCA to reflect this determination and the non-Federal cost-sharing be modified in accordance with Section 103(a) (3) of Water Resources Development Act of 1996. A Project Cooperation Agreement (PCA) for Prado Dam was executed in February 2003.

Analysis of the non-Federal sponsors' financial capability to participate in the project affirms that Riverside and San Bernardino Counties still have a reasonable plan for meeting their financial commitments. Orange County has identified a funding shortfall that may impact the schedule for acquiring lands in the Prado basin and the raising of the Prado spillway.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$1,555,735,000 is an increase of \$42,630,000 from the latest estimate of \$1,513,105,000 presented to Congress (FY 2017). This change includes the following items.

Item	Amount
Price leveling, inflation and other adjustments (including contingency adjustments) (Reach 9/Alcoa Dike/River Road Dike/Norco Bluffs/Spillway/Santiago Creek)	\$42,630,000
Total	\$42,630,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The final Environmental Impact Statement was filed with the Environmental Protection Agency in June 1989. The Records of Decision (ROD) for Prado Dam and San Timoteo Creek Reach 3B were executed in January 2002. Additional supplement environmental documents have been prepared prior to construction of each feature.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY 1979. Funds to initiate construction were appropriated in 1990.

An agreement with U.S. Fish and Wildlife Service (USFWS) on Section 7 consultations for endangered species (including Santa Ana woolly star and spine flower below Seven Oaks and Least Bell's vireo at Prado Dam) was reached on the number of acres for types of mitigation. The USFWS provided the final biological opinion (BiOp) necessary for formal conclusion of the consultation June 22, 1989. Subsequently, San Bernardino Kangaroo Rat was emergency listed and Seven Oaks Dam construction was stopped in January 1998. Through formal consultation, the USFWS issued two BiOps in February 1998 and December 2002 that allowed dam construction to continue and included future dam operation. Newly listed species, Santa Ana Sucker and designated critical habitat for the Least Bell vireo at Prado dam required additional consultation, which was completed in December 2001.

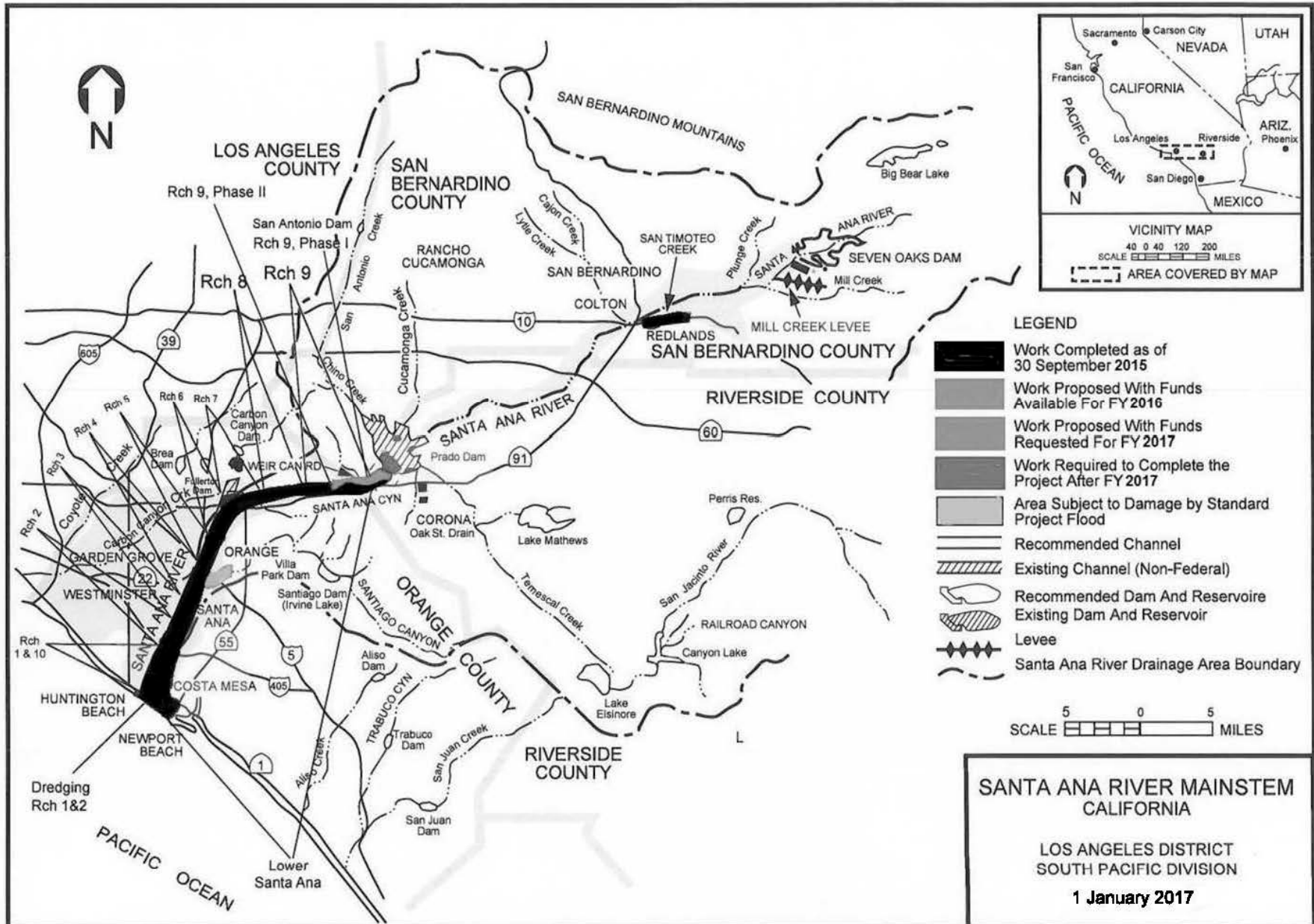
Coordination with the USFWS and the California Department of Fish and Game was initiated early in the planning of alternatives and completed March 30, 1989, which produced a Fish and Wildlife Service Coordination Act Report that was included in the Environmental Impact Statement. These agencies had a role in the determination of project associated impacts as well as mitigation needs and opportunities. The estimated fish and wildlife mitigation cost for Seven Oaks Dam is \$10,000,000, for San Timoteo is \$5,000,000, for Lower Santa Ana is \$28,000,000, and for Prado Dam is \$18,000,000.

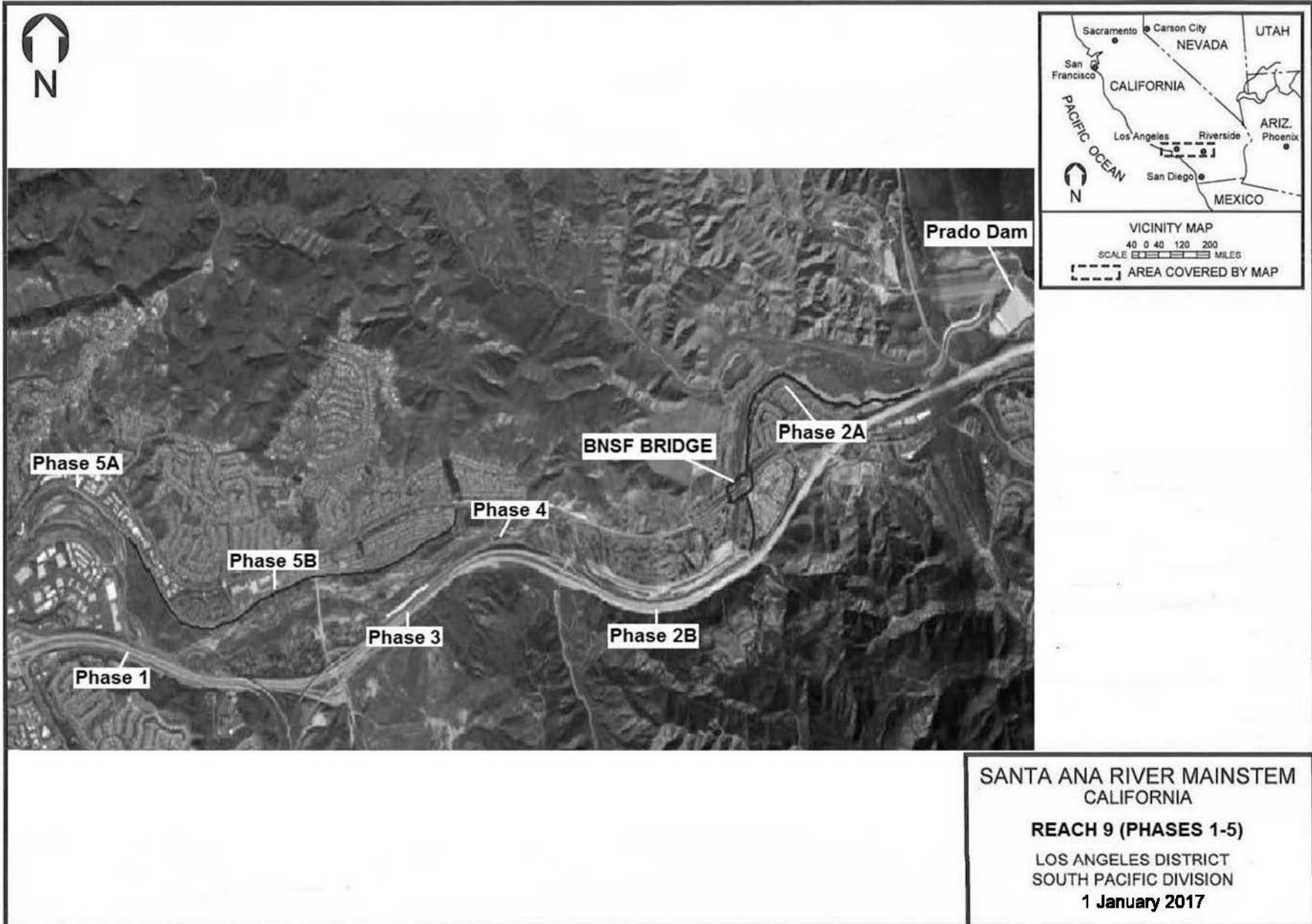
The project was modified by Section 104 of the Energy and Water Development Appropriation Act of 1988, which authorized the construction of San Timoteo Creek in the vicinity of Loma Linda as part of the Santa Ana River Mainstem Project and raised the total costs for the Santa Ana Mainstem, including Santiago Creek, by \$25,000,000. Construction was initiated in August 1994 and completed in November 2007 with funds specifically identified in Act language for a total of \$76,650,000.

The project was modified by the Water Resources Development Act of 1990, which authorized the Secretary to develop recreational trails and facilities on lands between Seven Oaks Dam and Prado Dam, including flood plain management areas. These features are not included in the current estimate pending development of plans, determination of costs, and support from local sponsors.

The project was modified by the Water Resources Development Act of 1996, which authorized the Secretary in coordination with the State of California, to provide technical assistance to Orange County, California, in developing appropriate public safety and access improvements associated with a portion of California State Route 71 that had been relocated for the Prado Dam project.

Congressional language in the Water Resources Development Act of 2007 increased the project cost to \$1,800,000,000 and included the Santa Ana River Interceptor line (SARI) as an authorized element of the project. This authority sufficiently increased the 902 maximum authorized total project cost to cover the added SARI line relocation, which is a 100% non-Federal cost.





APPROPRIATION TITLE: Construction - Flood Risk Management, Fiscal Year 2018

PROJECT: Yuba River Basin, California (Continuing)

LOCATION: The City of Marysville is located on the left bank of the Feather River in northern California in Yuba County approximately 50 miles north of the City of Sacramento, California. The towns of Linda and Olivehurst are across the Bear River to the South and Yuba City is across the Feather River to the West. A ring levee encircles the entire city of Marysville, California.

DESCRIPTION: The project, as authorized, includes constructing or deepening of slurry walls, deepening toe drains, constructing or modifying berms to strengthen existing levees on the Yuba and Feather Rivers and Jack Slough and to provide increased flood risk management benefits. The project is separated into three reaches: Reach 1 (Linda/Olivehurst), Reach 2 (Lower Reclamation District (RD) 784), and Reach 3 (Marysville Ring Levee(MRL)). The programmed portion of this project includes Reach 3, MRL, which is being constructed in six distinct phases (1, 2A, 2B, 2C, 3 and 4). The total estimated cost of the programmed work is \$153,246,000 and is shared 65 percent Federal and 35 percent non-Federal.

REACH 1 - Linda/Olivehurst (Complete) – Project sponsors completed improvements to all of the existing levees in Reach 1 in September 2012 under 33 U.S.C. Section 408 permission. An Integral Determination Report (IDR) was approved in March 2014 to enable the California Central Valley Flood Protection Board (CVFPB) to receive credit for the advance work they completed; the credit can be applied to their share of the construction work on the Marysville Ring Levee (MRL).

REACH 2 - Lower Reclamation District (RD) 784 (Complete) – Project sponsors completed improvements to all of the existing levees in Reach 2 in November 2009 under 33 U.S.C. Section 408 permission. Although parts of Reach 2 might have been considered economically justified for Federal investment, a reevaluation of Reach 2 concluded that any advanced work performed by the non-Federal sponsors on this reach had exceeded their required contributions for the remaining construction work on the MRL. Therefore, Reach 2 was dropped from the project.

REACH 3 - MRL - The only element of the authorized Yuba River Basin being constructed by the Federal Government. To facilitate construction, the project has been separated into geotechnical sections based on factors of safety due to seepage and other items in order to streamline the design and contracting approach. Reach 3 (MRL) element is under design and construction in six distinct phases (1, 2A, 2B, 2C, 3 and 4).

PHASE 1 (Complete) – Phase 1 was funded through the American Recovery and Reinvestment Act, completed in June 2013 and turned over to the non-Federal sponsor, Marysville Levee District (MLD), on July 31, 2014.

PHASE 2A – This project phase is situated on the levee in the southwestern part of the city of Marysville with Riverfront Park and consists of a 2,600 foot long seepage control cutoff wall constructed parallel with the levee. Construction of this phase is scheduled to initiate and complete in 2017; project initiation is contingent upon the non-Federal sponsors ability to acquire permanent Rights of Entry from the Union Pacific Railroad (UPRR) for construction and maintenance. Construction of Phase 2A was previously funded and scheduled to complete in FY 2016, but the schedule for its completion was moved to FY 2017 due to timing of execution of the UPRR agreement.

Division: South Pacific

District: Sacramento

Yuba River Basin, CA

PHASE 2B - This project phase is situated on the levee in the southeastern part of the city of Marysville near the historic downtown area and consists of a 4,000 foot long seepage control cutoff wall constructed parallel with the levee. Construction of this phase is scheduled to start and complete in 2018.

PHASE 2C - This project phase is situated on the levee in the southern part of the city of Marysville and consists of a seepage control cutoff wall constructed parallel with the levee. Construction of this phase is scheduled to complete in 2017.

PHASE 3 - This project phase is situated on the levee in the southern part of the city along Highway 20 and consists of seepage control cutoff wall and levee reshaping. The cutoff varies from 30 to 60 feet in depth and the width is 3 feet.

PHASE 4 - This project phase is situated on the levee in the northwestern part of the city of Marysville near State Highway 70 and crosses two Union Pacific Railroad (UPRR) railroad tracks. The project consists of a 600 foot long, 15 foot wide by 7 foot tall stability berm constructed parallel with the levee abutting the landside of the levee. In FY 2015, non-Federal sponsors negotiated a Right of Entry agreement with UPRR needed to proceed to construction on Phase 4A and construction of this phase was completed in 2016.

AUTHORIZATION: Water Resources Development Act, Pub. L. 110-114, § 3041, 121 Stat. 1041, 1116 (2007); Section 101(a)(10) of the Water Resources Development Act, Pub. L. 106-53, § 101(a)(10), 112 Stat. 269, 275 (1999)

REMAINING BENEFIT-REMAINING COST RATIO: 2.2 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: 1.7 to 1 at 7 percent.

INITIAL BENEFIT-COST RATIO: 2.3 to 1 at 4 1/8 percent.

BASIS OF BENEFIT-COST RATIO: Benefits are from the evaluation contained in the Yuba River Basin Investigation, California, Limited Reevaluation Report (LRR) dated August 2011 at October 2011 price level. The LRR for the MRL was approved by South Pacific Division (SPD) on October 31, 2011 and information was formalized in the December 18, 2012 approved LRR.

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PERCENT COMPLETE	PHYSICAL COMPLETION SCHEDULE
<u>Separable Element 1 – Reach 3 (Marysville Ring Levee)</u>			Reach 3	8	TBD
Estimated Federal Cost	\$ 65,092,000		- Phase 1	100	2013
			- Phase 2A	0	2017
Estimated Non-Federal Cost	\$ 34,542,000		- Phase 2B	0	2018
Cash Contribution	\$7,891,000		- Phase 2C	0	2017
Other Costs	\$26,651,000		- Phase 3	0	TBD
			- Phase 4A	0	2016

Division: South Pacific

District: Sacramento

Yuba River Basin, CA

Total Separable Element 1 Cost \$ 99,634,000

SUMMARIZED FINANCIAL DATA (Cont.)			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2016)	PERCENT COMPLETE	PHYSICAL COMPLETION SCHEDULE
<u>Separable Element 2 – Reach 1</u>				Reach 1	100	Sep 2012
Estimated Federal Cost		\$ 35,173,000				
Estimated Non-Federal Cost		\$ 18,939,000				
Cash Contribution	\$0					
Other Costs	18,939,000					
Total Separable Element 2 Cost		\$ 54,112,000				
 <u>Total Project</u>						
Estimated Federal Cost		\$100,265,000				
Estimated Non-Federal Cost		53,481,000				
Cash Contribution	\$7,892,000					
Other Costs	45,590,000					
Total Project Cost		\$ 153,747,000	6/ 7/ 8/			
Authorized Cost (plus inflation)	136,096,000					
Maximum Cost Limit (Section 902)	157,636,000					
Allocations to 30 September 2014		\$ 24,828,000	7/ 8/			
Allocation for FY 2015		7,000,000				
Allocation for FY 2016		7,361,000				
Allocation for FY 2017		7,000,000				

Division: South Pacific

District: Sacramento

Yuba River Basin, CA

Allocations through FY 2017	46,189,000	1/ 2/ 3/ 5/	46
Estimated Unobligated Carry-In Funds	9,662,000	4/	
President's Budget for FY 2018	12,400,000		59
Programmed Balance to Complete after FY 2018	41,676,000	6/	

1/ \$262,000 reprogrammed to the project.

2/ \$365,000 rescinded from the project.

3/ \$175,000 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$9,662,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this effort is \$9,662,000.

5/ PED costs of \$1,423,254 are included in this amount.

6/ American Recovery and Reinvestment Act funding of \$13,157,709 was used to construct Reach 3 MRL Phase 1.

7/ Estimated Total Project Cost includes reduction of \$35,664,000 from the certified Total Project Cost Summary for ineligible and excess credit in accordance with EC1165-2-208; reduction proportionally attributed to Reach 1 (36%) and Reach 3 (64%) respectively.

8/ Allocations exclude General Reevaluation Report (GRR) costs of \$8,991,000, which is the federal share of \$11,988,000; GRR costs removed from the total project cost summary as per ASA (CW) memo dated February 12, 2014 and noted in the Integral Determination Report (IDR).

PHYSICAL DATA: Levee improvements: slurry walls (Reach 1) - 6.7 miles; toe drains (Reach 1) - 9.0 miles; berms (Reach 1) - 9.5 miles; slurry walls and berms along ring levee (Reach 3) - 5.0 miles.

JUSTIFICATION: The principal urban centers within the project area include Marysville and Yuba City with current populations (2010 Census) of 12,800 and 63,600, respectively. The Marysville and Yuba City areas have experienced at least six significant floods – in November 1950, December 1955, December 1964, January 1965, February 1986 and January 1997. Record floodflows occurred with the 1955 flood and resulted in the loss of 37 lives when a levee on the Feather River south of Yuba City failed and inundated approximately 100,000 acres of land. Modifications to flood damage reduction facilities in the intervening 10 years, including partial completion of the State's Oroville Dam project, helped prevent damage during the 1964-65 flood, whose floodflows may have exceeded those of the 1955 event. Despite the existing flood damage reduction infrastructure, the area is still vulnerable to catastrophic flooding as demonstrated by the February 1986 event. During the 1986 flood, the south levee on the Yuba River failed, inundating the towns of Linda and Olivehurst to depths of approximately 10 feet. More than 24,000 people were evacuated and damages to property were estimated at \$95 million. The floods of January 1997 caused a levee break on the Feather River that was stabilized using emergency construction authority. However, over twenty square miles of land were inundated which included the Yuba City airport, roughly 800 homes, and portions of two major highways (65 and 70). Approximately 15,000 people were evacuated and three lives were lost. The 1997 event resulted in total estimated \$82.4 million of damages. Flood risk for Marysville Reach 3 is being reduced by construction of a separable element that consists of about five miles of slurry walls and berms along the ring levee surrounding the city of Marysville. Following the flood in 1997, the non-Federal sponsor, using funding from the State of California Early Implementation Program, constructed improvements to strengthen the levees in the Reclamation District 784 area.

The flood rate and depth based on a levee failure during a 60-year event could reach 10 feet in four hours. The risk to life stems from extreme cold water. In 49 degree water, a person reaches unconsciousness in 30 to 60 minutes with an expected time of survival of one to three hours. The average annual benefits for the Reach 3 MRL are \$11,856,000 and are all flood benefits.

FISCAL YEAR 2017: Carry-in funds will be applied as follows:

Award Phase 2A North Construction Contract (includes project oversight)	5,000,000
Engineering and Design During Construction	2,000,000
Total	\$ 7,000,000

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

Continue Design for Phases 2B and 3	\$ 1,062,000
Award Phase 2C Construction Contract (includes S&A)	7,800,000
Award Phase 2A South of MRL Construction Contract (includes S&A)	13,200,000
Total	\$22,062,000

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended by Section 202 (a) of the Water Resources Development Act of 1996, the non-Federal sponsor must comply with the requirements listed below:

	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Requirements of Local Cooperation		
Provide lands, easements, rights of way, and borrow and excavated or dredged material disposal areas.	\$20,756,000	
Pay 21.3 percent of the costs allocated to flood damage reduction to bring the total Non-Federal share of flood control costs to 35 percent, as determined under Section 103(m) of the Water Resources Development Act of 1986, as amended, to reflect the non-federal sponsor's ability to pay, as reduced for credit allowed for work in kind (Section 3041 of the Water Resources Development Act of 2007), but not less than 5 percent of the costs allocated to flood risk management, and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood damage reduction facilities.	32,725,000	\$8,000
Total non-Federal Costs	\$53,481,000	\$8,000

The non-Federal sponsor has also agreed to make all required payments concurrently with project construction.

STATUS OF LOCAL COOPERATION: The Department of the Army and the California Central Valley Flood Protection Board (CVFPB) and the MLD, the non-Federal sponsors, signed a Project Partnership Agreement (PPA) in July 2010. An Integral Determination Report (IDR), approved by the ASA(CW) in March 2014, determined that the the non-Federal sponsor may be afforded credit for in-kind design and construction work performed by the CVFPB on the Reach 1 levees to be applied towards the non-Federal cash contribution for the Reach 3 MRL element, as per section 3041 of WRDA 2007 . In FY 2017, the Corps will amend the PPA to add all of the Reach 1 separable element to the Reach 3 separable element and to add provisions to allow such credit for some of the in-kind contributions performed by the State of California of improvements to Reach 1. The amount of the eligible in-kind contributions exceed the non-Federal share of the project costs. Therefore, the excess amount cannot be credited and has been excluded from the total project cost. However, exclusion of these costs reduces the required non-Federal five percent cash payment. The sponsor agrees with current costs and continues to be financially able to support the project.

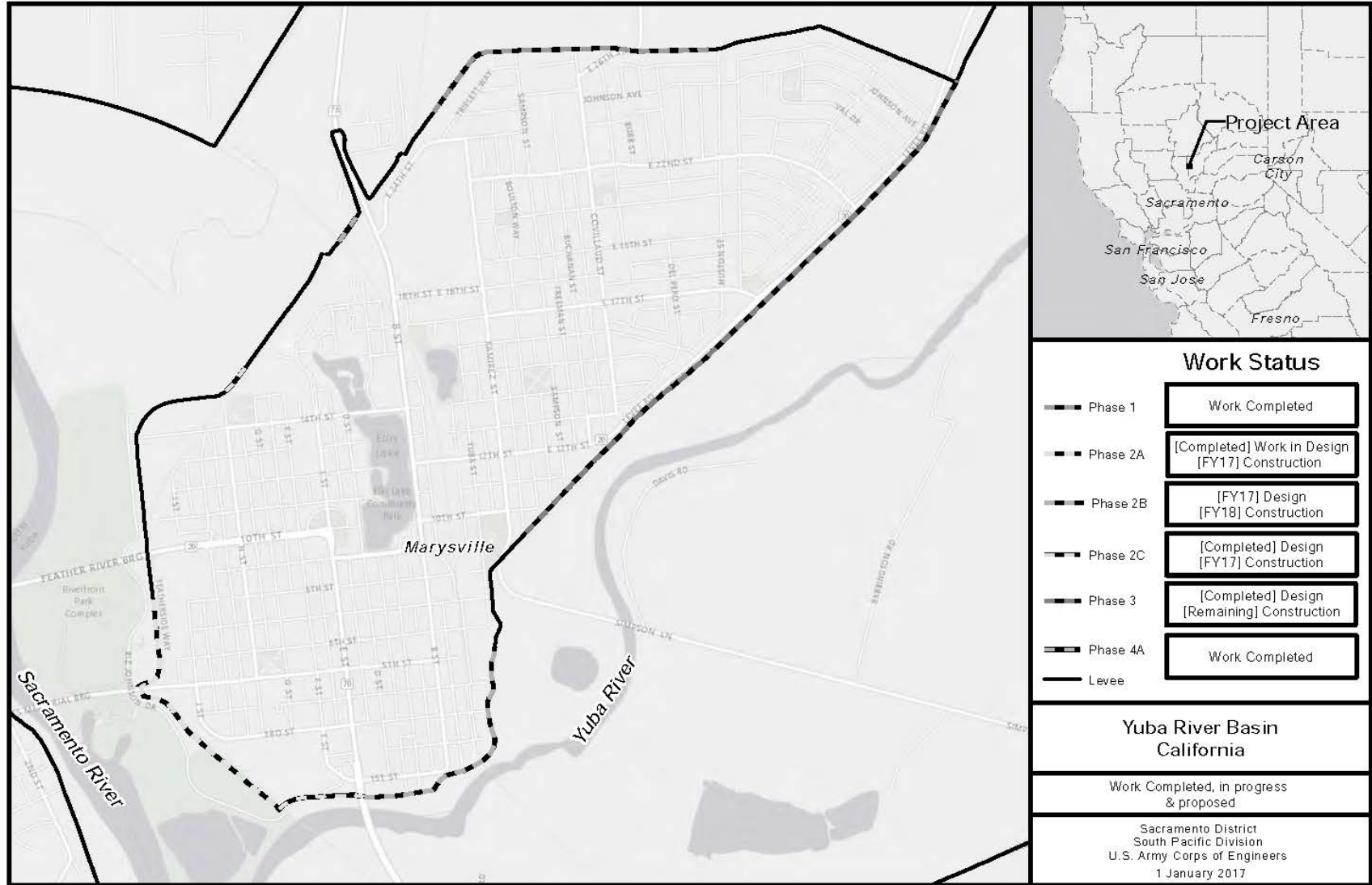
COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$100,265,000 is an increase of \$941,000 from the latest estimate (\$99,324,000) presented to Congress (FY 2017). This change includes the following items:

Item	Amount
Post Contract Award and other Estimating Adjustments	\$789,000
Cultural Resources	152,000
Total	\$941,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The Final Environmental Impact Statement (EIS)/Environmental Impact Report (EIR) was filed with the Environmental Protection Agency in April 1998. Record of Decision (ROD) was signed June 28, 2000. An Environmental Assessment (EA)/Finding of No Significant Impact (FONSI) was completed and executed for the MRL in April 2010. The Corps is developing a supplemental EA for Phase 2C, 2A S, 2B and 3.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY 1998 and funds to initiate construction were appropriated in FY 2003.

In a letter dated April 3, 2009, the ASA(CW) approved the sponsor's request under Section 103(L) of the WRDA 1986 to defer the sponsor's cash contribution of the Reach 3 MRL separable element for up to one year. This deferral expired August 3, 2011 and was not renewed. The CVFPB provided their required cash contribution for the deferred amount.



APPROPRIATION TITLE: Construction – (Flood Risk Management – Dam Safety Action Classification (DSAC) I Replacement), Fiscal Year 2018

PROJECT: Herbert Hoover Dike, Florida (Continuing)

LOCATION: The Herbert Hoover Dike (HHD) is located in Lake Okeechobee, Florida. HHD is a multi-purpose project authorized for flood control, water supply, and navigation. The dike encircles Lake Okeechobee, except in the vicinity of Fisheating Creek on the western shore. The existing embankments total about 143 miles in length with typical crest elevations rising about 25 feet above adjacent land elevations.

DESCRIPTION: The Major Rehabilitation Report (MRR), approved in November 2000, divided the dike into 8 Reaches and included a detailed analysis of alternatives in Reach 1. The MRR proposed construction of a seepage/drainage berm along the landside toe of the dike for Reach 1. Following input from a variety of expert sources, the U.S. Army Corps of Engineers (Corps) convened an independent technical review panel to further evaluate the design of the proposed repairs, which were underway. After reviewing the findings of this panel, the Corps decided to fundamentally alter its plans for strengthening the HHD. The new design concept includes toe-ditch fill, cutoff wall at the center of the dike, and seepage berm. The revised risk reduction strategy, which is now being implemented, includes the completion of structure tie-ins in the previously constructed Reach 1 cutoff wall between the St. Lucie Canal and Hillsboro Canal, and continued construction replacing the water control structures (culverts) around Lake Okeechobee. The MRR Supplemental, approved in June 2015, details an extension of Reach 1 for additional cutoff wall construction between the Hillsboro Canal and Miami Canal in order to reduce the risk in the inundation zone below Reach 1 to tolerable risk guidelines. The Dam Safety Modification Report (DSMR), approved in August 2016, includes the final measures to reduce the remaining system wide risks at HHD to tolerable risk guidelines.

AUTHORIZATION: HHD is a component of the Central and Southern Florida (C&SF) Project for Flood Control and Other Purposes. The C&SF Project was authorized in the Rivers and Harbors Act of 1930, the Flood Control Acts of 1948, 1954, 1958, 1960, 1965 and 1968; 1970, Section 103 and, the Water Resources Development Acts of 1986, 1988, 1990, 1992, 1996, 2007.

REMAINING BENEFIT - REMAINING COST RATIO for the project as a whole: Not applicable since the project is a dam safety project.

TOTAL BENEFIT - COST RATIO: Not applicable since the project is a dam safety project.

INITIAL BENEFIT - COST RATIO: Not applicable since the project is a dam safety project.

BASIS OF BENEFIT - COST RATIO: Not applicable since the project is a dam safety project.

SUMMARIZED FINANCIAL DATA				ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost		\$2,072,524,000			Initial Levees	100	October 2012
Estimated Non-Federal Cost		\$0			Culverts	59	TBD
Cash Contributions	\$0				Remaining Levees	0	TBD
Other Costs	\$0				Entire Project	51	TBD
Total Estimated Project Cost		\$2,072,524,000					
Authorized Cost (plus inflation)	\$963,352,000		<u>7/</u>				
Admin Maximum Cost Limit (Section 902)	\$1,148,668,000		<u>6/</u>				
Allocations to 30 September FY 2014		\$728,687,000	<u>8/</u>				
Allocation for FY 2015		\$76,896,000					
Allocation for FY 2016		\$67,141,000					
Allocation for FY 2017		\$68,170,000					
		\$					
		940,894,000					
Allocations through FY 2017			<u>1/ 2/ 3/ 5</u>	45.4			
Estimated Unobligated Carry-In Funds		\$0	<u>4/</u>				
President's Budget for FY 2018		\$82,000,000		49.4			
Programmed Balance to Complete after FY 2018		\$1,049,630,000					
Un-programmed Balance to Complete after FY 2018		\$0					

1/ \$13,000,000 reprogrammed to the project.

2/ \$405,218 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$0. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$0 are included in this amount.

6/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

7/ Authorized Cost based on the MRR – November 2000, Central & Southern Florida Culvert Letter Report for HHD – 2011, and the MRR Supplemental Report - 2015

8/ The allocation for FY 2014 was erroneously shown as \$86,000,000 on the FY 2016 and FY 2017 justification sheets. The correct allocation for FY 2014 was \$86,005,000. The allocations to 30 September FY 2014 has been corrected accordingly.

PHYSICAL DATA: The dam safety work at the HHD system consists of implementation of risk reduction features throughout approximately 143 miles of levee surrounding Lake Okeechobee, with the replacement and/or removal or abandonment of 32 culverts.

JUSTIFICATION: The Corps has classified the HHD as a Dam Safety Action Classification (DSAC) 1, which is defined by ER 1110-2-1156 as “Very High Urgency” where progression toward failure is confirmed to be taking place under normal operations, and the dam is almost certain to fail under normal operations within a few years without intervention; or the incremental risk – combination of life or economic consequences with likelihood of failure – is very high. Work on the HHD involves three simultaneous efforts: completion of Reach 1 cutoff wall, replacement of existing water control structures (culverts), and the implementation of the risk reduction features approved in the DSMR. The work on HHD involves the construction of a cutoff wall between Port Mayaca and Belle Glade and the replacement of 28 water control structures (culverts) and the removal or abandonment of 4 culverts. As an interim measure, the Corps has changed the operating regime for Lake Okeechobee to lower the probability of failure from seepage. The ongoing dam safety work includes the construction of features such as partial seepage berms, relief trenches and structural solutions for removing or replacing existing culverts and other penetrations through the embankment. The chance of breach or failure is dependent on lake elevation and other factors such as hurricanes that could affect a population of up to 50,000 people at risk with a variable risk-warning time (anywhere from 8 hours to no advance warning depending on the lake stage at time of breach, location of the breach, and type of breach). Currently, the probability of catastrophic dike failure due to piping is unacceptably high. Such an event would produce flooding, which could (depending on its location) lead to the loss of life and/or significant economic damage. The Corps is proceeding first with work in the areas of the dike where the potential risk is the greatest. Any such failure would also adversely affect the ecosystem of Lake Okeechobee (directly) and the estuaries of the Indian River Lagoon and the Caloosahatchee River (indirectly). It would also reduce the ability to store water in the lake for release in dry years for consumptive uses and to benefit the ecosystem of the Everglades.

FISCAL YEAR 2017: The total unobligated dollars are being applied as follows:

Continue Design	\$1,000,000
Continue Construction of Culverts	\$36,970,000
Continue Engineering During Construction	\$7,000,000
Continue Design/Field Investigation	\$2,980,000
Continue Construction Management	\$12,000,000
Contract Award for Extension of Reach 1 Cut Off Wall	\$8,220,000
Total	\$68,170,000

FISCAL YEAR 2018: The budget amount plus carry-in funds will be applied as follows:

Continue Design	\$3,793,000
Continue Engineering During Construction	\$7,650,000
Continue Construction Management	\$11,816,000
Continue Construction of Culverts/Modification	\$38,871,000
Continue Construction of Reach 1 Cutoff Wall/Modification	\$19,870,000
Total	\$82,000,000

Division: South Atlantic

District: Jacksonville

Herbert Hoover Dike, FL

NON-FEDERAL COST: Except for the need for the local sponsor to provide lands, easements, and rights of way, there is no cost share requirement for the current project under the applicable authorizations. Non-Federal cost listed in the above financial summary table are in accordance with the cost sharing and financing concepts reflected in the original, 1930's-era legislation.

	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Requirements of Local Cooperation		
Provide lands, easements, and rights of way	\$0	\$0
Total Non-Federal Costs	\$0	\$0

STATUS OF LOCAL COOPERATION: The non-Federal sponsor, South Florida Water Management District (SFWMD), commits to items of local cooperation through a process involving resolutions. For the Herbert Hoover Dike, SFWMD issued Resolutions 12 (1948) and 398 (1949). The repairs to the Herbert Hoover Dike are being 100% federally funded. Any additional real estate or easements required for the repairs are the responsibility of the local sponsor.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$2,072,524,000 is a decrease of \$11,789,000 from the latest estimate (\$2,084,313,000) presented to Congress (FY 2017). This change includes the following items:

Item	Amount
Price Escalation on Construction Features	\$21,050,000
Schedule Changes	\$20,702,000
Post Contract Award and Other Estimating Adjustments (including contingency adjustments)	\$(53,541,000)
Total	\$(11,789,000)

STATUS OF ENVIRONMENTAL IMPACT STATEMENT (EIS) COMPLIANCE: A Supplemental EIS was prepared in January 2005 and the Record of Decision was signed in September 2005.

The preparation of a required Environmental Assessment (EA) for the removal and replacement of the federal culverts within the HHD system was completed in May 2011.

The preparation of a required Environmental Assessment (EA) for the seepage collection/filtering system pilot test was completed in December 2011.





The preparation of a required Environmental Assessment (EA) for the MRR Supplement report was completed in June 2015.

The preparation of a required Environmental Impact Statement (EIS) for the Dam Safety Modification Report was completed and the Record of Decision was signed in August 2016.

OTHER INFORMATION: Funding for the major rehabilitation was first appropriated in FY 2001.

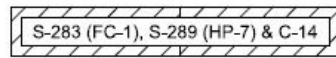
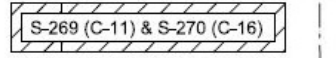
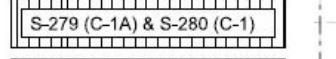
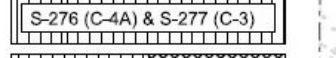
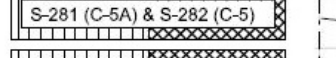
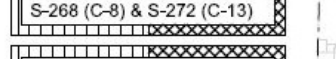

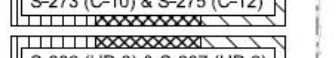
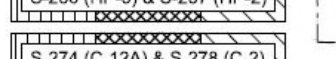
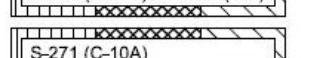

A value engineering (VE) study was completed on design for Reach 1 described in the 2000 MRR. The VE recommendation was a modified plan of the recommended plan in the MRR. Subsequently, a Detailed Design Report (DDR) analyzed the VE plan and determined that it permitted too much seepage flow through the section and impacted local flood control. Following input from a variety of expert sources, the Corps convened an independent technical review panel to further evaluate the design of the proposed repairs, which were underway. After reviewing the findings of this panel, the Corps fundamentally altered its design for strengthening the HHD. Preliminary analyses indicated that construction of a cutoff wall in conjunction with landside repairs would be required within a 27-mile stretch in the southwestern portion of the dike, which when complete would increase reliability of the portion of the dike at greatest risk of failure. The HHD Dam Safety Modification Report was prepared for the entire HHD system and also evaluated alternative designs for their feasibility and potential to reduce the project cost.

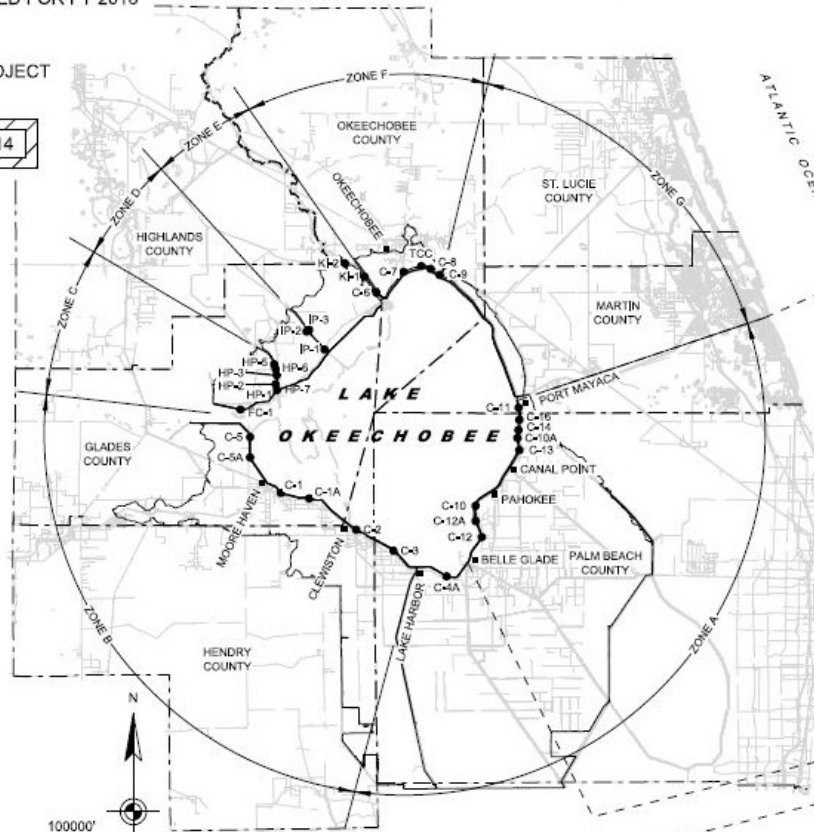
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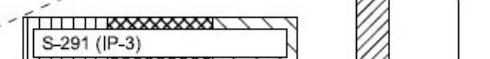
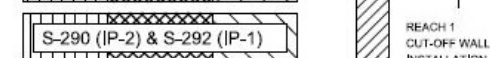
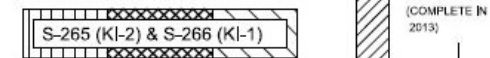
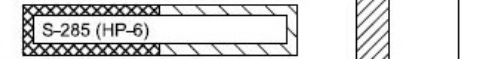
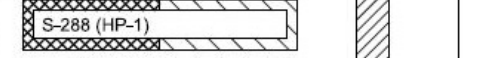
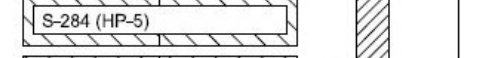
-  WORK COMPLETED AS OF 30 JANUARY 2016
-  WORK UNDERWAY WITH FUNDS AVAILABLE FOR FY 2017
-  WORK PROPOSED WITH FUNDS REQUESTED FOR FY 2018
-  WORK REQUIRED TO COMPLETE THE PROJECT AFTER FY 2018

COMMON INUNDATION ZONES	
A	29.1 MILES
B	37.7 MILES
C	14.5 MILES
D	13.2 MILES
E	21.8 MILES
F	16.7 MILES
G	17.5 MILES



-  S-283 (FC-1), S-289 (HP-7) & C-14
-  S-269 (C-11) & S-270 (C-16)
-  S-279 (C-1A) & S-280 (C-1)
-  S-276 (C-4A) & S-277 (C-3)
-  S-281 (C-5A) & S-282 (C-5)
-  S-268 (C-8) & S-272 (C-13)
-  S-267 (C-6)
-  S-273 (C-10) & S-275 (C-12)
-  S-286 (HP-3) & S-287 (HP-2)
-  S-274 (C-12A) & S-278 (C-2)
-  S-271 (C-10A)



-  S-291 (IP-3)
 -  S-290 (IP-2) & S-292 (IP-1)
 -  S-265 (KI-2) & S-266 (KI-1)
 -  S-285 (HP-6)
 -  S-288 (HP-1)
 -  S-284 (HP-5)
 -  C-7, C-9 & TCC
- REACH 1 CUT-OFF WALL INSTALLATION (COMPLETE IN 2013)
- MRR SUPPLEMENTAL CUTOFF WALL
- (REACH 1 EXTENSION)



HERBERT HOOVER DIKE REHABILITATION

01 JANUARY 2017
 U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION, JACKSONVILLE DISTRICT

PROJECT STATUS MAP (RCS CECW-B-13)

APPROPRIATION TITLE: Construction – Environmental Restoration, Fiscal Year 2018

PROJECT: South Florida Ecosystem Restoration Program, Florida (SFER) (Continuing)

LOCATION: The South Florida Ecosystem Restoration (SFER) Program stretches from the southern Orlando area southward across the Everglades, the Florida Keys, and the contiguous and near-shore waters of South Florida, and across South Florida from east to west including portions of the drainage areas of the Indian River Lagoon and the Caloosahatchee River, as well as population centers along the southeast and southwest coasts. The project area is defined by the political boundaries of the South Florida Water Management District (SFWMD), and includes all of the Everglades. It encompasses an area of approximately 18,000 square miles, which includes all or part of 18 counties in the southeast part of the state of Florida. Principal areas include the Kissimmee River Basin, Lake Okeechobee, Everglades Agricultural Area, Upper East Coast, Lower East Coast, Big Cypress Basin, Water Conservation Areas, Everglades National Park, Southwest Florida, Florida Bay and the Florida Keys.

DESCRIPTION: The objective of the SFER Program is to restore, protect and preserve the South Florida ecosystem, including the Everglades, while providing for other water related needs of the region. The SFER Program includes the Central and Southern Florida (C&SF) Project, the Kissimmee River Restoration Project, the Everglades and South Florida (E&SF) Restoration Project, and the Modified Waters Deliveries Project. The completed C&SF Project includes 1,000 miles of canals, 720 miles of levees and several hundred water control structures, which provide water supply, flood damage reduction, water management and other benefits to south Florida. Under SFER, numerous C&SF projects— including West Palm Beach Canal, C-111 (South Dade), Comprehensive Everglades Restoration Plan (CERP), and Manatee Pass Through Gates— were or are being undertaken to address adverse environmental impacts caused in large part by the C&SF flood project's modification of historic Everglades flows. The Everglades National Park receives virtually its entire source of water (other than direct rainfall) from the Central and Southern Florida Project.

Picayune Strand Restoration Project: The CERP Picayune Strand (Southern Golden Gate Estates) Restoration Project will restore and enhance 55,247 acres of wetlands (cypress/freshwater marsh and wet prairie) in an abandoned real estate development, formerly known as Southern Golden Gates Estates, and adjacent public lands that were drained in the early 1960s. The purpose of this project is to restore natural and beneficial sheetflow of water to the Ten Thousand Islands National Wildlife Refuge, historical overland waterflows to the South, while maintaining flood control measures for areas to the North and the West. The restoration will improve the functionality of habitat for the Florida Panther, Smalltooth Sawfish, Manatee and Wood Stork and the water quality of coastal estuaries by moderating the large salinity fluctuations caused by freshwater point discharge of the Faka Union Canal as well as wetland/upland mosaic habitat west of the Everglades. The project will also aid in protecting the City of Naples eastern Golden Gate wellfield by improving groundwater and aquifer recharge. The project includes a combination of spreader basins, levees, canal plugs, road and tram removal and pump stations for the Prairie, Merritt, Faka Union and Miller Canals. The Picayune Strand Project Implementation Report (PIR), which is a component of the Comprehensive Plan, was completed in December 2004. A Chief's Report on the PIR was signed on September 15, 2005. Construction was initiated with funds provided by the non-Federal sponsor and continues with appropriated funds. Specifically, the local sponsor, South Florida Water Management District, completed construction of some of the road demolition and plugging of the Prairie canals. The remaining construction of 3 pump stations (with capacities of 800, 2,650 and 1,200 cubic feet per second), road removal and plugging of canals is currently under construction by the Corps. FY 2009 regularly appropriated and American Recovery and Reinvestment Act (ARRA) funds were used to award the first pump station, the Merritt pump station, in October 2009, construction is complete and the feature was transferred to the sponsor in FY 2016. The second pump station (Faka Union) was awarded on November 22, 2010, physical construction was completed in FY 2016, and transfer to the sponsor will occur in FY 2017. The construction contract for the Miller Pump station was awarded in September FY 2013 and is scheduled for completion in FY 2017 with transfer to the sponsor in FY 2018. Ongoing construction efforts will not exceed the section 902 limit and are currently scheduled for completion in FY 2018. A Post Authorization Change Report to address increased costs for the project, which are due to design changes determined to be necessary to meet project objectives and increases in the cost of supplies and materials for construction of the pump stations was finalized and the project was reauthorized in the WIIN Act 2016.

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

Indian River Lagoon: The CERP Indian River Lagoon (IRL) feasibility study was initiated in 1996. This study evaluated potential modifications to the C&SF Project for ecological restoration of Indian River Lagoon ecosystem. A final feasibility report, which included components of the CERP, was submitted to HQUSACE in FY 2002. The Project Implementation Report (PIR), required by WRDA 2000, for Indian River Lagoon South was completed August 2004 and recommended a plan in Martin, St. Lucie, and Okeechobee Counties that will reduce the damaging effects of watershed runoff, reduce high peak discharges, reduce nutrient loads, provide water quality benefits to control salinity, pesticides, and other pollutants presently discharged to the estuary, restores 117 acres of wetlands including seagrass, restores and improves the functionality of habitats for the Wood Stork, Green Sea Turtle and West Indian Manatee, and provide water supply for agriculture to offset reliance on the Floridian Aquifer. The plan includes 170,000 acre-feet of reservoir storage (C-44 Reservoir, C-23/24 North/South Reservoirs and C-25 Reservoir), and storm water treatment areas (C-44 West/East, C-23, C-24, and C-25), and provides storage on 92,000 acres of natural storage areas (Allapattah, Palmar, and Cypress Creek). A Chief's Report on the PIR was signed August 4, 2004. The project moderates unnatural salinity changes which cause detrimental effects to estuarine communities. The authorized project also includes steps to remove up to 7,900,000 cubic yards of muck from the St. Lucie River and Estuary. Construction of the intake canal of the C-44 Reservoir and STA component was initiated in July 2011 and was completed in July of 2014. Construction of the C-44 Reservoir was initiated in the 4th quarter of FY 2015. Construction of the C-44 stormwater treatment area (initiated in 2014) and pump station (initiated in 2015) is being implemented by the non-federal sponsor.

Caloosahatchee River (C-43) West Basin Storage Reservoir: The C-43 Project Implementation Report, which is a component of the Comprehensive Plan, was completed in September 2007. However the final report was on hold pending a decision on the CERP land valuation policy, which was resolved in August 2009. A final report was prepared based on current CERP land valuation guidance and submitted to Headquarters November 17, 2009. The PIR recommended a selected alternative plan that provides approximately 170,000 acre-feet of above-ground storage volume in a two-cell reservoir with normal pool depths when the reservoir is full; pool depths vary from 15 feet at the southeast corner to 25 feet at the northwest corner. The recommended plan improves functional fish and wildlife habitat in the Caloosahatchee River Estuary. The portion of the Everglades ecosystem directly affected by the Caloosahatchee River (C-43) and Estuary provides habitat for 21 federally-listed endangered or threatened species, including the Florida panther, Everglades snail kite, wood stork, manatee, eastern indigo snake, Audubon's crested caracara and five species of sea turtles. The Chief's Report was signed in March 2010 and a Supplemental Chief's Report was signed in January 2011 to clarify cost sharing requirements on recreational features. The Record of Decision was signed and transmitted to Congress on April 13, 2011. The purpose of the Caloosahatchee River (C-43) West Basin Storage Reservoir Project is to contribute to the restoration of the Caloosahatchee Estuary as part of a comprehensive plan for restoring the south Florida ecosystem. The project encompasses 10,700 acres. The non-Federal sponsor is constructing this project to advance realization of benefits by reducing damaging discharges to the Caloosahatchee Estuary and the Corps is currently providing oversight of construction.

Kissimmee River Restoration: Local water resource development of the Kissimmee River began in the late 1800's. In the 1960's, the river was channelized as part of the C&SF Project. Although the project has provided for navigation and reduced flood damages as intended, it also resulted in long-term degradation of the natural ecosystem. The 103-mile river that historically meandered across and inundated about 35,000 acres of wetlands over a broad flood plain was reduced to a 56-mile canal that has successfully contained almost all flows since its completion. The channelization coupled with the modifications of the Lower Basin tributary watersheds and efficient control of floodwaters and regulation of inflows from the Upper Basin significantly altered hydrologic characteristics of the ecosystem. Project formulation and scoping was based on the most cost-effective plan that would meet fish and wildlife resources objectives for restoring ecological integrity. Completion of the project will result in the restoration of 52 miles of river; 27,000 acres of wetlands; improved water quality characteristics for the Kissimmee River; and restored conditions for over 300 fish and wildlife species. Funds to initiate construction for the Kissimmee River Restoration were appropriated in FY 1993. The Project Cooperation Agreement was signed with the South Florida Water Management District March 22, 1994. Construction was initiated in FY 1997. The Kissimmee Basin includes 3,000 square miles stretching from Orlando to Lake Okeechobee in central Florida. The Kissimmee River Restoration project involves the ecosystem restoration of the historic floodplain to re-establish wetland conditions by implementing the following: modifications to the operation of the upper chain of lakes; modification of various structures; enlargement of canals 36 and 37; backfilling 22 miles of canal 38; excavation of about nine miles of new river

channel; removal of two water control structures and locks, flood proofing of developments around the lakes and land acquisition of over 100,000 acres. It restores 110,000 acres of riverine wetland system including beakrush wet prairies, broadleaf march, hardwoods, cypress strands and sawgrass and restores/improves the functionality of habit for the Wood Stork, Caracara, Snail Kite and Bald Eagle. The project also includes acquisition of fee title for lands within the 5-year-floodplain and acquisition of flowage easements for lands between the five-year-flood line and the 100-year-flood line. A Post Authorization Change Report is being developed to seek crediting authority for actions taken and proposed to be performed by the non-Federal sponsor that were integral to implementation of the project. The Kissimmee Basin Modified Water Control Plan (KBMWCP) Environmental Impact Statement effort will include an operational and structural analysis of the post-Kissimmee River Restoration operations for the existing and new structures in the Upper and Lower Kissimmee Basins.

AUTHORIZATION: Flood Control Acts of 1948, 1954, 1960, 1962, 1965, and 1968; Authorization in 1970 under Section 201 of the Flood Control Act of 1965, and the Water Resources Development Acts (WRDA) of 1986, 1988, 1990, 1992, 1996, 1999, 2000, and 2007; the Water Resources Reform and Development Act (WRRDA) of 2014; and the Water Infrastructure Improvements for the Nation Act 2016 (WIIN Act). The Modified Water Deliveries to Everglades National Park was authorized under the Everglades Expansion Act of 1989 (PL 101-229). PL 101-229 specifically directs the Secretary of the Army, in consultation with the Secretary of Interior, to construct modifications to the C&SF Project to improve water deliveries to ENP. The Upper St. Johns River Basin was authorized under Flood Control Acts of 1948, 1954, 1958, 1965, Post Authorization Report 1984 and Water Resources Development Act 1986.

REMAINING BENEFIT-REMAINING COST RATIO: N/A; Ecosystem Restoration Project

TOTAL BENEFIT-COST RATIO: The total benefit cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms. Incremental cost analysis (CE/ICA) was used to calculate the cost effectiveness of building the selected plans for each separable element within the SFER Program. For the CERP each of the projects highlighted in the Plan were further developed and analyzed in Project Implementation Reports and a CE/ICA was completed for each based on cost and environmental benefits. In addition, all projects recommended under the CERP alternative, undergo a Next Added Increment (NAI) analysis to determine what benefits the selected plan contributes to without regard to future CERP projects. It also determines whether sufficient benefits will accrue to justify the cost of the project if no additional CERP projects (other than those already existing or authorized) are implemented.

INITIAL BENEFIT-COST RATIO: The initial benefit-cost ratio for the entire project is not applicable because environmental benefits have not been quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: N/A; Ecosystem Restoration Project

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT Cmpl	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost (CoE)		\$6,890,746,000		C-51 West Palm Beach	97	TBD
Programmed Construction	\$6,266,755,000			C-111 (South Dade)	81	TBD
Un-programmed Construction	\$623,991,000			CERP	27	TBD
				Kissimmee	86	TBD
Estimated Federal Cost (OFA)		\$506,074,000		C-43 West Basin Storage	10	TBD
Programmed Construction	\$506,074,000			Reservoir		
Un-programmed Construction	\$0			Picayune Strand	77	TBD
				Indian River Lagoon	20	TBD
Estimated Total Federal Cost		\$7,396,820,000		South		
Programmed Construction	\$6,772,829,000			C-111 Spreader Canal	90	TBD
Un-programmed Construction	\$623,991,000			Site1 Impoundment	30	TBD
				Mod Waters Deliveries	99	TBD
Estimated Non-Federal Cost		\$6,174,367,000		Upper St John's River	99	July 2016
Programmed Construction	\$5,844,193,000			Basin		
				Melaleuca Eradication	100	July 2013
Cash Contributions	\$3,038,709,000			Manatee Pass Gates	100	September 2012
Other Costs	\$2,805,484,000			Seminole Big Cypress	100	March 2017
				Ten Mile Creek	100	May 2016
Un-programmed Construction	\$330,174,000			Lake Okeechobee: Water		
Cash Contributions	\$175,490,000			Retention and	100	February 2015
Other Costs	\$154,684,000			Phosphorus Removal		
				Western C-111	100	September 2005
Total Estimated Programmed Construction Cost	\$12,617,022,000			Florida Keys:		
Total Estimated Un-programmed Construction Cost	\$954,165,000			Carrying Capacity	100	December 2004
Total Estimated Project Cost	\$13,571,187,000			E Coast Canal	100	September 2004
				Tamiami Trail:		
				Western Culverts	68	TBD
				Southern CREW	90	TBD
				Lake Trafford	95	TBD
				Misc. Completed Works	100	October 1992

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

SUMMARIZED FINANCIAL DATA (Continued)

		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2016)	PCT Cmpl	PHYSICAL COMPLETION SCHEDULE
Allocations to 30 September FY 2014	\$2,263,367,000				
Allocations for FY 2015	\$73,200,000				
Allocation for FY 2016	\$126,742,000				
Allocation for FY 2017	\$114,500,000				
Allocations through FY 2017	\$2,577,809,000	1/ 2/ 3/ 4/		41%	
Estimated Unobligated Carry-In Funds	\$0	5/			
President's Budget for FY 2018	\$76,500,000			42%	
Programmed Balance to Complete after FY 2018	\$3,612,446,000	6/			
Un-programmed Balance to Complete after FY 2018	\$623,991,000				

1/ \$11,429,000 reprogrammed from the project. \$6,449,000 reprogrammed to the project.

2/ \$3,733,000 rescinded from the project.

3/ \$26,500,000 transferred to the Flood Control and Coastal Emergencies account.

4/ PED costs of \$560,616 are included in this amount.

5/ Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$1,044,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$1,450,000 for C-111 South Dade for project oversight and closeout.

6/ For programmed work only; remaining work is un-programmed pending a decision to construct these features.

PHYSICAL DATA:

Pumping Plants	42	Each
Floodway Control & Diversion Structures	292	Each
Recreation	9	Each
Relocations		
Highway Bridges	2	Each
Railroads Bridges	58	Each
Canals		
New River Channel	17	Each
Water Control Structures Removal	2	Each
Locks	25	Each
Canals	1,057	Miles
Levees	844	Miles
Bridge	8	Each

JUSTIFICATION:

Average annual damages are an estimated \$110,580,000 without the Central and Southern Florida (C&SF) project and \$22,536,000 with the C&SF project. Damages attributable to urban property are 16.7 percent and 83.3 percent are attributable to rural property. The proportion of average annual damages prevented is 36.8 percent to existing development and 63.2 percent to future development.

Average annual benefits of the C&SF Project, excluding restoration projects are as follows:

Annual Benefits	Amount
Flood Control	\$235,213,000
Municipal and Industrial Water Supply	\$25,664,000
Agricultural Water Supply	\$27,614,000
Recreation	\$11,109,000
Fish and Wildlife	\$238,000
Area Redevelopment	\$3,012,000
Total	\$302,850,000

The Everglades National Park receives virtually its entire source of water (other than direct rainfall) from the C&SF Project. The pumping rate for irrigation of 590 square miles would yield approximately 917,850 acre-feet per year for agricultural use. Recurrent drought conditions with resultant low flows require supplemental irrigation to ensure adequate crop yields.

C&SF restoration projects connect state and federal preserve lands for plant and animal species; enhance wetland and other habitats; enhance water quality, including moderating unnatural salinity changes which cause detrimental effects to estuarine communities; reduce seepage losses from the natural system .

The Corps is working in stages to restore natural hydrological conditions in Everglades National Park (ENP). Public Law 90-483 and Public Law 101-229 (Everglades National Park Protection and Expansion Act) authorized modifications to the C&SF project for environmental restoration in the C-111 basin and Shark River Slough.

FISCAL YEAR 2017: The appropriated funds, plus unobligated carry-in funds, will be applied as follows:

Central and Southern Florida:

Non-CERP

Upper St. Johns – Complete Deficiency Report \$ **536,000 5/**

C-111 South Dade - Fully fund Contract 8a, Construction Management and oversight, Engineering and Design, Post Authorization Change Report, Land Admin/Independent External Peer Review. **12,661,000**

Fully fund Contract 8a	\$	9,121,000
Engineering and Design/Supervision and Administration	\$	750,000 5/
C-111 South Dade Post-Authorization Change Report	\$	1,000,000
Land Admin/Independent External Peer Review	\$	471,000
Project Oversight/Closeout	\$	1,319,000 5/
C-111 South Dade Sub-total	\$	12,661,000

C-51 West Palm Beach Canal – Project Closeout \$ **1,000,000**

Non-CERP Sub-Total \$ **14,197,000 5/**

CERP

CERP Picayune Strand - Complete Faka Union Pump Station and Continue work on Miller Pump Station (Construction Management, Engineering and Design, and Operational Testing and Monitoring) \$ **4,657,000**

CERP Indian River Lagoon South - Continue Construction on the CERP Indian River Lagoon South C-44 Reservoir (Construction Management, Engineering and Design, and Oversight of Sponsor Construction on Indian River Lagoon South C-44 Pump Station) \$ **59,521,000**

Continue Construction on the CERP Indian River Lagoon South C-44 Reservoir	\$	53,331,000
Construction Management for CERP Indian River Lagoon South	\$	3,752,000
Engineering and Design CERP Indian River Lagoon South	\$	1,938,000
Oversight of Sponsor Construction on Indian River Lagoon South C-44 Pump Station	\$	500,000

CERP Indian River Lagoon South Sub-total \$ **59,521,000**

CERP Caloosahatchee C-43 WBSR Construction Oversight \$ **500,000**

CERP C-111 Spreader Canal – Takings Analysis	\$	75,000
CERP Loxahatchee River Watershed Project Implementation Report (feasibility-level study) – Continue study	\$	952,000
CERP Western Everglades (Big Cypress/L-28 Interceptor) Project Implementation Report (feasibility-level study) – Continue study	\$	800,000
CERP Lake Okeechobee Watershed Project Implementation Report (feasibility-level study) – Continue study	\$	800,000
CERP Design		
Adaptive Assessment and Monitoring	\$	4,037,000 5/
Public Outreach	\$	25,000
Program Management	\$	2,003,000 5/
Information and Data Management	\$	200,000
RECOVER	\$	1,417,000 5/
Interagency Modeling Center	\$	500,000
CERP Sub-Total	\$	75,487,000
Subtotal : Central and Southern Florida	\$	89,684,000
Kissimmee:		
Lower Basin	\$	15,603,800
Fully fund construction of S-69 Weir	\$	11,960,000
Engineering During Construction/Supervision and Administration/ Project Oversight/Contingency for S-69 Weir	\$	1,540,000
Project Oversight/Construction Management	\$	2,000,800 5/
Engineering and Design/Supervision and Administration of McArthur Ditch	\$	103,000
Lower Basin Sub-total	\$	15,603,800
Upper Basin - Fully fund construction of Embankment Repair and Real Estate		
Crediting and Project Oversight	\$	8,675,000
Real Estate Crediting and Project Oversight	\$	175,000
Fully fund construction of Embankment Repair	\$	8,500,000
Upper Basin Sub-total	\$	8,675,000
Subtotal: Kissimmee	\$	24,278,800
Everglades and South Florida (E&SF) –		
Program Management	\$	121,000 5/

Seminole Big Cypress Reservation Plan	\$	11,000 5/
Everglades and South Florida (E&SF) Subtotal	\$	132,000 5/
South Florida Ecosystem Restoration FY 2017 Total	\$	114,094,800 5/

FISCAL YEAR 2018: The budgeted amount will be applied as follows:

Non-CERP

C-111 South Dade		
Engineering and Design/Supervision and Administration	\$	450,000 5/
Project Oversight/Closeout	\$	1,000,000 5/
C-111 South Dade Sub-total	\$	1,450,000 5/
Non-CERP Sub-Total	\$	1,450,000 5/

CERP

CERP Picayune Strand		
Complete Construction of Miller Pump Station	\$	4,500,000
CERP Indian River Lagoon South		
Continue Reservoir Construction and Oversight of Sponsor Construction of Pump Station	\$	60,930,450
CERP Caloosahatchee C-43 WBSR - Construction Oversight	\$	1,500,000
CERP Loxahatchee River Watershed (feasibility-level study) – Complete study	\$	514,550
CERP Central Everglades Planning Project (CEPP)		
Initiate Limited Reevaluation Report for PPA North	\$	200,000
Initiate Limited Reevaluation Report for PPA South	\$	200,000
CERP CEPP Subtotal	\$	400,000
CERP Design		
Adaptive Assessment and Monitoring	\$	3,750,000
Interagency Modeling Center	\$	500,000
Public Outreach	\$	5,000
Information & Data Management	\$	200,000
RECOVER	\$	1,000,000
Program Management	\$	2,000,000
CERP Sub-Total	\$	75,300,000

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

Kissimmee:

Closeout/Project Oversight/Construction Management of previously awarded contracts	\$	1,200,000
Kissimmee River Sub-total	\$	1,200,000

South Florida Ecosystem Restoration FY 2018 Total **\$ 77,950,000**

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in specific authorizing legislation and the Water Resources Development Act of 1986, 1996, 2000 and 2007 and Water Resources Reform and Development Act of 2014 as applicable, the non-Federal sponsor must comply with the requirements listed below:

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, & Replacement Costs
Completed Central and Southern Florida Works:		
Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities	\$176,459,000	\$0
Cash Contribution/Work-In-Kind	\$232,241,000	\$0
Subtotal Non-Federal Costs: Completed Central and Southern Florida Works	\$408,700,000	\$0
Upper St. Johns River Basin		
Provide lands, easements, rights of way, and dredged material disposal areas.	\$86,232,000	
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	\$11,060,000	
Pay one-half of the separable costs allocated to recreation (except recreational navigation) and bear all costs of operations, maintenance, repair, and replacement of recreational facilities.	\$3,616,000	\$82,000
Subtotal Non-Federal Costs: Upper St. Johns River Basin	\$100,908,000	\$82,000
C&SF C-111 (South Dade)		
Provide lands, easements, rights of way, and dredged material disposal areas	\$141,170,000	\$0
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	\$419,000	\$0
Pay one-half of the cost of the project assigned to flood control and bear a percentage of costs of operation, maintenance, repair, rehabilitation, and replacement of flood control facilities.	\$11,325,000	\$2,119,000
Subtotal Non-Federal Costs: C-111 (South Dade)	\$153,760,000	\$2,119,000

C&SF West Palm Beach Canal:

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

Provide lands, easements, rights of way, and dredged material disposal areas.	\$16,011,000	\$0
Modify or relocate utilities, roads, bridges (except railroad bridges), and other facilities, where necessary for the construction of the project.	\$ 1,471,000	\$0
Pay 12.8 percent of the separable costs allocated to flood control and bear all costs of operation, maintenance, repair, rehabilitation, and replacement of facilities.	\$12,811,000	\$290,000
Subtotal Non-Federal Costs: West Palm Beach Canal	\$30,293,000	\$290,000

Requirements of Local Cooperation (Continued)	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
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C&SF Manatee Pass-Through Gates:

Pay applicable percentage of 0%, 15% or 20% based upon authorized cost share of each particular feature of the project and bear cost of operation, maintenance, repair, rehabilitation, and replacement of manatee protection features except for structures S-77, S-78, S-79, S-308 and S308B.	\$2,456,000	\$450,000
Subtotal Non-Federal Costs: Manatee Pass-Through Gates	\$2,456,000	\$450,000

C&SF Comprehensive Everglades Restoration Plan (CERP)

Provide lands, easements, rights of way, and dredged material disposal areas	\$537,493,000	\$0
Pay one-half of the cost of the project assigned to flood control and bear one half of the cost of operation, maintenance, repair, rehabilitation, and replacement of CERP facilities.	\$976,764,000	\$0
Subtotal Non-Federal Costs: Comprehensive Everglades Restoration Plan (CERP)	\$1,514,257,000	\$0

CERP Indian River Lagoon South

Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities	\$1,433,088,000	\$0
Cash Contribution/Work-In-Kind/Bear 50% off costs of operation, maintenance, repair, rehabilitation, and replacement.	\$438,965,000	\$6,145,000
Subtotal Non-Federal Costs: CERP Indian River Lagoon South	\$1,872,053,000	\$6,145,000

CERP Picayune Strand

Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities	\$168,492,000	\$0
Cash Contribution/Work-In-Kind/Bear 50% off costs of operation, maintenance, repair, rehabilitation, and replacement.	\$140,515,000	\$2,950,000
Subtotal Non-Federal Costs: CERP Picayune Strand	\$309,007,000	\$2,950,000

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

CERP Caloosahatchee River (C-43) West Basin Storage Project		
Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities.	\$74,966,000	\$0
Cash Contribution/ Work-In-Kind/Bear 50% off costs of operation, maintenance, repair, rehabilitation, and replacement.	\$341,087,000	\$1,500,000
Subtotal Non-Federal Costs: CERP Caloosahatchee River (C-43) West Basin Storage Project	\$416,053,000	\$1,500,000

Requirements of Local Cooperation (Continued)	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
CERP C-111 Spreader Canal Western Project		
Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities.	\$47,919,000	\$0
Cash Contribution/ Work-In-Kind/Bear 50% off costs of operation, maintenance, repair, rehabilitation, and replacement.	\$18,923,000	\$734,000
Subtotal Non-Federal Costs: CERP C-111 Spreader Canal Western Project	\$66,842,000	\$734,000
CERP Biscayne Bay Coastal Wetlands		
Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities	\$84,795,000	\$0
Cash Contribution/Work-In-Kind/Bear 50% off costs of operation, maintenance, repair, rehabilitation, and replacement.	\$11,591,000	\$936,500
Subtotal Non-Federal Costs: CERP Biscayne Bay Coastal Wetlands	\$96,386,000	\$936,500
Kissimmee River		
Provide lands, easements, rights of way, and modify or relocate buildings, utilities, roads, bridges and other facilities	\$304,865,000	\$0
Cash Contribution/ Work-In-Kind/Bear all costs of operation, maintenance, repair, rehabilitation, and replacement.	\$88,627,000	\$477,000
Subtotal Non-Federal Costs: Kissimmee River	\$393,492,000	\$477,000
Modified Water Deliveries to Everglades National Park (OFA Costs)		
Provide, with credit toward Department of Interior's share of the project costs, all lands, easements, rights of way, and excavated or dredged material disposal areas.	\$156,000	\$0
Pay share of project costs and bear a percentage of costs of operation, maintenance, repair, rehabilitation, and replacement of the completed project, or functional portion of the project except water control structures and outlets in Water Conversation Area 3.	\$0	\$200,000
Subtotal Non-Federal Costs: Modified Water Deliveries to Everglades National Park (applied to OFA Costs)	\$156,000	\$200,000

STATUS OF LOCAL COOPERATION: Assurances of local cooperation have been accepted from the local sponsor, the South Florida Water Management District, for all works authorized under the Central and Southern Florida (C&SF) project. The Design Agreement for the Comprehensive Everglades Restoration Plan (CERP) was executed with the South Florida Water Management District on May 12, 2000.

The Kissimmee Project Cooperation Agreement which reflects the cost sharing outlined in House Document 102-286 dated April 7, 1992 was executed with the South Florida Water Management District (SFWMD) in March 1994. The local sponsor will be required to provide a cash contribution for project costs in excess of land credit (reflecting credit for lands, easements, rights of way, relocations, and disposal areas).

The CERP Master Agreement was executed on 13 August 2009 between the Corps and the South Florida Water Management District. A Project Partnering Agreement (PPA) was executed on the CERP: Picayune Strand project in August 2009 with the South Florida Water Management District. The CERP Design Agreement was amended on 13 August 2009 to reflect authority to balance cost share of design and construction activities across CERP projects.

A Project Partnership Agreement was executed with SFWMD for the Indian River Lagoon South Project in September 2010. An amendment to the PPA for the Indian River lagoon – South project was executed in August 2014.

A PPA was executed on the CERP: C-43 West Basin Storage Reservoir project in June 2016 and PPAs were executed on the CERP: Biscayne Bay Coastal Wetlands and CERP: Broward County WPA projects in August 2016.

In August 2009, five Pre-Partnership Credit Agreements (PPCA) were executed with the South Florida Water management District: Picayune Strand, Indian River Lagoon South, C-43 Caloosahatchee River West Basin Storage Reservoir, C-111 Spreader Canal, and the Biscayne Bay Costal Wetlands projects. A PPCA was executed for the CERP: Central Everglades Planning Project in May 2016.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal (Corps cost estimate for the Corps' share of the overall restoration effort) cost estimate of \$6,890,746,000 is a decrease of \$245,103,000 from the latest estimate (\$7,135,849,000) presented to Congress (FY 2017). The changes include the following:

Item	Amount
Price Escalation on Construction Features	\$136,190,000
Design Changes and Other Estimating Adjustments (including contingency adjustments)	\$356,217,000
Schedule Changes	\$(737,510,000)
Total	\$(245,103,000)

STATUS OF ENVIRONMENTAL IMPACT STATEMENT:

The latest Programmatic Environmental Impact Statements for Central and Southern Florida project was the Comprehensive Review Study in April 1999. NEPA documents have also been completed for the Indian River Lagoon South, Picayune Strand, Site 1 Impoundment, Melaleuca Eradication, C-111 Spreader Canal, Caloosahatchee River (C-43) West Basin Storage Reservoir, Broward County Water Preserve Areas, and Biscayne Bay Coastal Wetlands projects.

The final Environmental Impact Statement for the Kissimmee project was filed with EPA on April 5, 1992. A supplement to the Environmental Impact Statement was integrated into the Upper Basin project modification report.

NEPA documents were completed prior to execution of the PCA for East Coast Canal Structures, Tamiami Trail Culverts (Western Culverts), Western C-11, Seminole Big Cypress, Southern Crew, Lake Okeechobee Water Retention, 10-Mile Creek, and Lake Trafford.

The Programmatic Environmental Impact Statement for the Upper St. Johns River Basin Project was approved September 4, 1986. The Three Forks Marsh Supplemental Environmental Impact Statement was approved January 2004.

OTHER INFORMATION: The C&SF project was originally authorized and designed as a flood control project in response to the maximum flood of record in 1947. The 1947 flood frequency averages 1 in 25 years over the project area, with an average duration of 70 days. Minor floods occur almost yearly in the project area and major floods occur frequently. This situation is aggravated by wet antecedent conditions followed by heavy seasonal rainfall. The average degree of protection provided by the completed project is about a 10-year flood frequency protection. Approximately 2,853,700 acres are protected. This encompasses 2,765,100 agricultural acres and 88,600 urban acres. The present value of property subject to flood damages is about \$12.3 billion. Residential, commercial, industrial, public, and agricultural property types are located within the project area. Funds to initiate preconstruction planning and construction on the Central and Southern Florida project were appropriated in FY 1950.

Under Public Law 90-483 (River and Harbor Act of 1968), additional project features for the purpose of water supply were added to the Central and Southern Florida project. The storage capacity of the entire project is 2,953,000 average annual acre-feet divided into approximately 1,600,000 acre-feet for urban use by 2020 and 740,000 acre-feet for agricultural use by 2020.

The Water Resources Development Act (WRDA) of 1992 authorizes the Chief of Engineers to review the Central and Southern Florida (C&SF) project to determine whether modifications to the existing project are advisable at the present time due to significantly changed physical, biological, demographic, or economic conditions, with particular reference to modifying the project or its operation for improving the quality of the environment, improving protection of the aquifer, and improving the integrity, capability, and conservation of urban water supplies affected by the project or its operation. The central organizing theme of the Comprehensive Restudy was the restoration of the South Florida ecosystem while accommodating other demands for water and related land resources in south Florida. Recognizing the complexity of ecological restoration and the extensive interaction between the ecosystem and other uses of water and related land resources, oversight of the reconnaissance level study effort was provided by the interagency South Florida Ecosystem Restoration Task Force, which continues to provide policy guidance, interagency coordination, and facilitate appropriate agency participation. WRDA 1992 also authorized the Kissimmee River Restoration project as the "Lower Basin" at a cost of \$426,885,000 and the Kissimmee River Headwaters known as the "Upper Basin" at a cost of \$92,210,000.

The Water Resources Development Act of 1996 (Section 528) required that a Comprehensive Restudy feasibility report be submitted to Congress, along with a Programmatic Environmental Impact Statement, in July 1999. The Final Integrated Feasibility Report and Programmatic Environmental Impact Statement were
OTHER INFORMATION (continued)

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

submitted to Congress on July 1, 1999. The report recommended a Comprehensive Everglades Restoration Plan (CERP). WRDA 1996 authorized implementation of the Everglades and South Florida (E&SF) Restoration Project in order to provide immediate, independent, and substantial ecosystem restoration, protection and preservation benefits. The authorization permitted implementation of nine projects that were justified on the basis of those benefits.

The Water Resources Development Act of 1999 authorized two pilot projects that were part of the CERP for \$29,000,000.

The Water Resources Development Act of 2000 authorized CERP as a conceptual framework for modifications and operational changes to the C&SF Project, providing specific authorization for 10 projects totaling \$1,100,000,000 (including \$100,000,000 for adaptive assessment and monitoring programs) and 4 pilot projects totaling \$69,000,000, and allowed for implementation of projects under a programmatic authority, not to exceed \$206,000,000. The Energy and Water Appropriations Act of FY 2000, Public Law 106-50 appropriated the first funds to initiate design of elements of the CERP.

The Water Resources Development Act of 2007 provided authorization for the following three CERP projects: Picayune Strand, Indian River Lagoon South and Site 1 Impoundment. It also provided a new authorized project cost for the Hillsboro and Lake Okeechobee ASR Pilot and the Caloosahatchee ASR Pilot projects; and a provision for the establishment of Section 902 limits for the Programmatic Authority projects. The Water Resources Development Act of 2007 amended authorization for the Everglades and South Florida Restoration (E&SF) Seminole Big Cypress project to increase the Federal share of project costs from \$25 million to \$30 million and increase the E&SF program from \$75 million to \$95 million.

The Water Resources Reform and Development Act of 2014 provided authorization for the following four CERP projects: Broward County Water Preserve Areas, Biscayne Bay Coastal Wetland (Florida), C-111 Spreader Canal Western Project, and Caloosahatchee River (C-43) West Basin Storage Reservoir.

The Water Infrastructure Improvements for the Nation Act of 2016 provided authorization for the CERP: Central Everglades Planning Project and reauthorized the CERP: Picayune Strand Project.

C-111 South Dade: The C-111 (South Dade) effort will help restore natural hydrologic conditions in Taylor Slough within Everglades National Park by providing immediate improvement in flow between upper Everglades Marsh (WCA 3a) and ENP which directly improves habitat for endangered species. The Project Cooperation Agreement (PCA) for the C-111 (South Dade) separable element was executed with the South Florida Water Management District in January 1995. A PCA amendment was executed in August 2014. The project was funded to completion in FY 2017 with anticipated carryover of \$1,450,000 into FY 2018 for project oversight/closeout and supervision and administration of the previously awarded contract.

Modified Water Deliveries to Everglades National Park Project: The Everglades National Park Protection and Expansion Act, signed December 13, 1989, authorized construction of works required to take steps to improve water deliveries to Shark River Slough in Everglades National Park, construction of flood mitigation works for the residential area in the East Everglades, and acquisition of 107,600 acres of privately owned wetlands in the East Everglades. The purpose of the project is to improve the conveyance of water between Water Conservation Areas (WCA) north of ENP and the Shark River Slough within the Park. The Department of the Interior and the State of Florida acquired the lands included in the ENP expansion area and the Secretary of the Army has responsibility for constructing all project modifications. PCAs were executed with the South Florida Water Management District September 1994 and executed the first amendment in July 2001 for the Modified Water Deliveries Project to implement modifications to the C&SF Project to improve water deliveries into Everglades National Park. PCA Amendment No. 2 was executed August 2008 for Tamiami Trail Modification. Under the initial implementation plan, funds were appropriated to the National Park Service and transferred to the Corps of Engineers for this purpose. From FY 2006 to FY 2008, Congress provided funding for this project to both the National Park Service and the Corps

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

OTHER INFORMATION (continued)

of Engineers. All subsequent funding is expected to be provided through National Park Service appropriations. The construction of the final project roadway components, the Tamiami Trail bridge and roadway raising, was initiated in FY 2010 and completed in December 2013. The final feature to be implemented to complete physical construction on the full project will be completed in 2017.

C-51 West Palm Beach Canal: The West Palm Beach Canal (C-51) project improves the quality of water entering Loxahatchee NWR & Lake Worth Lagoon as well as reducing freshwater pulse flows which adversely affect habitat in Lake Worth Lagoon. This project was funded to completion in FY 2016 and additional funds were provided in FY 2017 for project closeout.

Site 1 Impoundment: The Project Implementation Report (PIR) for Site 1 Impoundment, which is a component of the Comprehensive Plan, was completed in August 2006. A Chief's Report on the PIR was signed on December 19, 2006. In August 2010, a Project Partnership Agreement was executed with SFWMD and the Phase 1 construction contract was awarded using ARRA funds. The purpose of the project was to reduce water withdrawals and seepage losses from the natural system and provides habitat improvement, while shifting consumptive water demands off of Loxahatchee National Wildlife Refuge (NWR) and Lake Okeechobee, and restore and improve the functionality of the habitat for the Wood Stork and Snail Kite. It includes a 1,660-acre project footprint with an eight foot deep above ground impoundment, pump station, discharge gated culvert, one combined service / auxiliary non-gated spillway and one auxiliary non-gated spillway, and a seepage control canal with an associated seepage pump station and overflow weir. An additional gated culvert structure is designed to control stages in L-36 Borrow Canal and North Springs Improvement District discharges into the Hillsboro Canal. Recreation features include boardwalks, viewing platforms, picnic shelters, canoe launches and information kiosks at one site within the footprint. This project was completed and transferred to the non-Federal sponsor in 2016.

C-111 Spreader Canal: The C-111 Spreader Canal Western Project Implementation Report, which is a component of the Comprehensive Plan, was completed in September 2009. The final PIR and Environmental Impact Statement (EIS) were approved at the Civil Works Review Board in December 2009. The Chief's Report was signed on January 31, 2012. The Record of Decision was signed on July 19, 2012 and transmitted to Congress on July 20, 2012. The purpose of this project is to improve the ecological function of Everglades National Park by creating a hydraulic ridge that will reduce drainage of the area by the C-111 Canal. It will consist of two above-ground detention areas, the approximately 590-acre Frog Pond Detention Area and an approximately 50-acre Aerojet Canal, which will serve to create a continuous and protective hydraulic ridge along the eastern boundary of Everglades National Park. Five additional features will be included that are intended to raise water levels in the eastern portion of the project area and restore wetlands in the Southern Glades and Model Lands. Major features of the detention areas include the construction of external levees and one approximately 225-cubic feet per second pump station for each detention area. Recreation components consist of a trailhead with parking, traffic controls, a shade shelter with interpretive board, and approximately 6.8 miles of multi-use levee trails atop impoundment levees. Restoration-compatible recreation includes hiking, biking, fishing, nature study, bird watching, state-managed hunts and equestrian use. This project was constructed by the non-Federal sponsor. Funds were provided in FY 2016 to execute a Project Partnership Agreement to afford the non-Federal sponsor credit for the work performed. However, due to language in the Chief's Report to complete a takings analysis, the sponsor requested that execution of the PPA be delayed pending final determination of lands required for the project.

Biscayne Bay Coastal Wetlands: The Biscayne Bay Project Implementation Report, which is a component of the Comprehensive Plan, was completed in August 2011. The final PIR and Environmental Impact Statement (EIS) were approved at the Civil Works Review Board in September 2011. The Chief's Report was signed on May 2, 2012. The Record of Decision was signed and transmitted to Congress on September 19, 2012. The purpose of the Biscayne Bay Coastal Wetlands project is to contribute to the restoration of Biscayne Bay and adjacent wetlands as part of a comprehensive plan for restoring the south Florida ecosystem. The project will also help restore saltwater wetlands and the near shore bay through the re-establishment of optimal salinity concentrations for fish and

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

OTHER INFORMATION (continued)

shellfish nursery habitat. This plan will rehydrate coastal wetlands and reduce damaging point source freshwater discharge to Biscayne Bay. This will also improve functional fish and wildlife habitat in Florida Bay and Biscayne Bay, by rehydrating coastal wetlands and reducing wasteful point source freshwater discharge. The project provides habitat for 21 federally-listed endangered or threatened species, including the West Indian Manatee, Florida Panther, Cape Sable Seaside Sparrow, and the American Crocodile. The Recommended Plan encompasses a footprint of approximately 3,761 acres and includes features in three of the projects four sub-components (hydrologically distinct regions of the study area): Deering Estate, Cutler Wetlands, and L-31 East Flow Way.

OTHER INFORMATION (continued)

Broward County Water Preserve Areas: The Broward County WPA Project Implementation Report, which is a component of the Comprehensive Plan, was completed in April 2007. However, the final report was on hold pending a decision on the CERP land valuation policy, which was resolved in August 2009. The final report was modified to reflect updated CERP land valuation guidance as well as other policy updates required since 2007. The Chief's Report was signed on May 21, 2012. The Record of Decision was signed and transmitted to Congress on November 2, 2012. The purpose of the project is to improve the ecological function of the Everglades ecosystem by capturing and storing excess surface water runoff from the C-11 watershed and reducing excess releases to the WCA 3A/3B, and will minimize seepage losses during dry periods. This would include a foot print of approximately 7,990 acres based on the three components: C-11 Impoundment, WCA 3A/3B Seepage Management Area (SMA), and C-9 Impoundment, as well as recreation features. This will also improve functional fish and wildlife habitat in Water Conservation Areas (WCA) 3A/3B, and in Everglades National Park. The portion of the Everglades ecosystem directly affected by the project provides habitat for five federally-listed species: West Indian manatee, Florida panther, wood stork, snail kite and Eastern indigo snake. Overall, an ecological lift of approximately 166,211 average annual habitat units will occur due to improved hydro periods and hydro patterns in the project area. Overall, approximately 563,000 acres in Water Conservation Area 3 and 200,000 acres in the greater Everglades will benefit from project implementation. The project includes a combination of canals, levees, water control structures, pumps, bridges and buffer marsh. Recreation features include 14 miles of improved trail surface, parking areas with ADA accessible waterless toilets, walkway to canoe launch facilities, and information kiosk, shaded benches, footbridges, trash receptacles and signage.

Everglades and South Florida (E&SF) Restoration Project: The E&SF Restoration projects include the following separable elements: East Coast Canal Structures, Western C-11 Basin, Seminole Big Cypress, Ten Mile Creek, Tamiami Trail (Western Culverts), Florida Keys Carrying Capacity, Lake Okeechobee Water Retention, Southern CREW, and Lake Trafford; each project must meet the following criteria: be within the C&SF Project and its near shore waters; provide immediate, independent, and substantial ecosystem restoration, protection, and preservation benefits; cost less than \$25 million in Federal funds; be consistent with the Governor's Commission's Conceptual Plan; and have a local sponsor to contribute a minimum of 50 percent of the total project cost. A Feasibility Cost Share Agreement (FCSA) was executed December 1998 for Florida Keys Carrying Capacity. PCAs were executed January 7, 2000 for East Coast Canal Structures, Tamiami Trail Culverts, Western C-11, Seminole Big Cypress, Southern Crew, Lake Okeechobee Water Retention, 10-Mile Creek, and Lake Trafford. Local sponsors include: South Florida Water Management District (SFWMD), Seminole Tribe of Florida, and the Florida Department of Community Affairs (DCA). East Coast Canal Structure, Western C-11 Basin, Florida Keys Carrying Capacity Study, Lake Okeechobee Water Retention and Phosphorus Removal have been completed. The local sponsors for the Tamiami Trail, Southern CREW, and Lake Trafford projects have elected to complete those projects independent of additional Federal funding. The Enacted Energy and Water Development Appropriations Act of 2010 included a general provision to increase the Everglades and South Florida Ten Mile Creek federal funding cap by \$3.5 million, an increase from \$25 million to \$28.5 million, to complete a Post Authorization Change Report (PACR) and continue preventative maintenance. The PACR would evaluate options to address project design deficiencies and identify cost effective remedies. The 2016 Consolidated Appropriations Act deauthorized this project as of May 2016 the constructed facility has been transferred to the South Florida Water Management District. The Seminole Tribe Water Conservation Project located on the Big Cypress Reservation consists of building conveyance canals that will

Division: South Atlantic

District: Jacksonville

South Florida Ecosystem Restoration, FL

OTHER INFORMATION (continued)

feed newly constructed impoundments. The impoundments function as natural habitats while improving water quality. The water flows from the Big Cypress Reservation and into the Big Cypress National Preserve. The Seminole Big Cypress project is scheduled to complete in FY 2017.

Upper St. Johns: Funds to initiate preconstruction, planning and construction for the C&SF Upper St. Johns River Basin were appropriated in 1966. The project was halted in 1972 pending completion of the Environmental Impact Statement (EIS). The Post Authorization Report was approved in 1984. The original EIS was approved in 1986, Chief of Engineers approved the revised General Design Memorandum (GDM) in 1986, and construction recommenced in 1988. The revised GDM approved a semi-structural Flood Control Project where storm water would be stored on existing and restored floodplain wetlands. Under this approach, flood protection and ecosystem restoration benefits could be gained from restoring floodplain wetlands and reducing freshwater discharges to the coastal estuary. The supplemental EIS for Three Forks Marsh was approved January 2004. The Three Forks Marsh feature is critical to allow the earlier completed components of the project to properly function to provide the designed flood control and ecosystem restoration benefits of this Federal project. Although this C&SF project provides both ecosystem restoration and flood protection, a decision was made to remove this separable element from the SFER environmental restoration program and capture only Environmental Restoration in the SFER Justification sheet. Assurances of local cooperation were accepted from the St. Johns River Water Management District for the Upper St. Johns River portion on 30 December 1987. Construction was physically completed in September 2016. A deficiency correction report is under development and will be completed using savings from the previously funded work.

Melaleuca Eradication: A Project Partnership Agreement was executed with SFWMD for Melaleuca Eradication and Other Exotic Plants in July 2010. Melaleuca Eradication was fiscally closed out on August 31, 2016.

A PCA amendment was executed for Manatee Pass Thru Gates in February 2015 to facilitate fiscal close-out of this construction activity. Manatee Pass Gates will fiscally close out in FY 2017.

SUMMARIZED FINANCIAL DATA – Separable Elements

C&SF Miscellaneous Completed Work

Estimated Federal Cost (CoE)			\$934,900,000
Programmed Construction		\$316,503,000	
Un-programmed Construction		\$618,397,000	
Estimated Federal Cost (OFA)			\$0
Programmed Construction		\$0	
Un-programmed Construction		\$0	
Estimated Total Federal Cost			\$934,900,000
Programmed Construction		\$316,503,000	
Un-programmed Construction		\$618,397,000	
Estimated Non-Federal Cost			\$408,700,000
Programmed Construction		\$84,118,000	
Cash Contributions	\$58,843,000		
Other Costs	\$25,275,000		
Un-programmed Construction		\$324,582,000	
Cash Contributions	\$173,398,000		
Other Costs	\$151,184,000		
Total Estimated Programmed Construction Cost			\$400,621,000
Total Estimated Un-programmed Construction Cost			\$942,979,000
Total Estimated Project Cost			\$1,343,600,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

Modified Water Deliveries to Everglades National Park

Estimated Federal Cost (CoE)			\$77,493,000
Programmed Construction		\$77,493,000	
Un-programmed Construction		\$0	
Estimated Federal Cost (OFA)			\$339,507,000
Programmed Construction		\$339,507,000	
Un-programmed Construction		\$0	
Estimated Total Federal Cost			\$417,000,000
Programmed Construction		\$417,000,000	
Un-programmed Construction		\$0	
Estimated Non-Federal Cost			\$156,000
Programmed Construction		\$156,000	
Cash Contributions	\$156,000		
Other Costs	\$0		
Un-programmed Construction		\$0	
Cash Contributions	\$0		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$417,156,000
Total Estimated Un-programmed Construction Cost			\$0
Total Estimated Project Cost			\$417,156,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

C&SF C-111 (South Dade)

Estimated Federal Cost (CoE)			\$147,113,000
Programmed Construction 8/	\$147,113,000		
Un-programmed Construction		\$0	
Estimated Federal Cost (OFA)			\$5,801,000
Programmed Construction	\$5,801,000		
Un-programmed Construction		\$0	
Estimated Total Federal Cost			\$152,914,000
Programmed Construction	\$152,914,000		
Un-programmed Construction		\$0	
Estimated Non-Federal Cost			\$152,914,000
Programmed Construction	\$152,914,000		
Cash Contributions	\$11,325,000		
Other Costs	\$141,589,000		
Un-programmed Construction		\$0	
Cash Contributions	\$0		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$322,996,000
Total Estimated Un-programmed Construction Cost			\$0
Total Estimated Project Cost			\$305,828,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

8/ Fed cost includes \$131,000 for Independent External Peer Review which is included in the total project cost, but is not to be cost shared with the local sponsor.

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

C&SF West Palm Beach Canal

Estimated Federal Cost (CoE)			\$293,859,000
Programmed Construction	\$293,859,000		
Un-programmed Construction		\$0	
Estimated Federal Cost (OFA)			\$46,000,000
Programmed Construction	\$46,000,000		
Un-programmed Construction		\$0	
Estimated Total Federal Cost			\$339,859,000
Programmed Construction	\$339,859,000		
Un-programmed Construction		\$0	
Estimated Non-Federal Cost			\$30,293,000
Programmed Construction		\$30,293,000	
Cash Contributions	\$12,811,000		
Other Costs	\$17,482,000		
Un-programmed Construction		\$0	
Cash Contributions	\$0		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$374,773,000
Total Estimated Un-programmed Construction Cost			\$0
Total Estimated Project Cost			\$370,152,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

**C&SF Upper St. John’s River Basin
(Completing in 2016)**

Estimated Federal Cost (CoE)			\$131,151,000
Programmed Construction		\$127,057,000	
Un-programmed Construction		\$2,094,000	
Estimated Federal Cost (OFA)			\$0
Programmed Construction		\$0	
Un-programmed Construction		\$0	
Estimated Total Federal Cost			\$131,151,000
Programmed Construction		\$127,057,000	
Un-programmed Construction		\$2,094,000	
Estimated Non-Federal Cost			\$100,908,000
Programmed Construction		\$98,816,000	
Cash Contributions	\$1,524,000		
Other Costs	\$97,292,000		
Un-programmed Construction		\$2,092,000	
Cash Contributions	\$2,092,000		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$226,485,000
Total Estimated Un-programmed Construction Cost			\$4,186,000
Total Estimated Project Cost			\$232,059,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

Comprehensive Everglades Restoration Plan (CERP)

Estimated Federal Cost (CoE) 10/ Programmed Construction	\$1,514,257,000	\$1,514,257,000
Un-programmed Construction	\$0	
Estimated Federal Cost (OFA) Programmed Construction	\$0	\$0
Un-programmed Construction	\$0	
Estimated Total Federal Cost Programmed Construction	\$1,514,257,000	\$1,514,257,000
Un-programmed Construction	\$0	
Estimated Non-Federal Cost Programmed Construction	\$1,514,257,000	\$1,514,257,000
Cash Contributions	\$976,764,000	
Other Costs	\$537,493,000	
Un-programmed Construction	\$0	
Cash Contributions	\$0	
Other Costs	\$0	
Total Estimated Programmed Construction Cost		\$3,028,514,000
Total Estimated Un-programmed Construction Cost		\$0
Total Estimated Project Cost		\$3,028,514,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

10/ The Federal cost also includes \$121,000 for Independent External Peer Review which is included in the total project cost, but is not to be cost shared with the local sponsor.

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

CERP Indian River Lagoon South

Estimated Federal Cost (CoE)		\$1,872,053,000
Programmed Construction	\$1,872,053,000	
Un-programmed Construction	\$0	
Estimated Federal Cost (OFA)		\$0
Programmed Construction	\$0	
Un-programmed Construction	\$0	
Estimated Total Federal Cost		\$1,872,053,000
Programmed Construction	\$1,872,053,000	
Un-programmed Construction	\$0	
Estimated Non-Federal Cost	\$1,872,053,000	\$1,872,053,000
Programmed Construction	\$1,872,053,000	
Cash Contributions	\$498,307,000	
Other Costs	\$1,433,088,000	
Un-programmed Construction	\$0	
Cash Contributions	\$0	
Other Costs	\$0	
Total Estimated Programmed Construction Cost		\$3,744,106,000
Total Estimated Un-programmed Construction Cost		\$0
Total Estimated Project Cost		\$3,744,106,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

CERP Picayune Strand

Estimated Federal Cost (CoE) 14/ Programmed Construction		\$270,922,000	\$270,922,000
Un-programmed Construction		\$0	
Estimated Federal Cost (OFA) Programmed Construction		\$38,085,000	\$38,085,000
Un-programmed Construction		\$0	
Estimated Total Federal Cost Programmed Construction		\$309,007,000	\$309,007,000
Un-programmed Construction		\$0	
Estimated Non-Federal Cost Programmed Construction		\$309,007,000	\$309,007,000
Cash Contributions	\$140,515,000		
Other Costs	\$168,492,000		
Un-programmed Construction		\$0	
Cash Contributions	\$0		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$618,014,000
Total Estimated Un-programmed Construction Cost			\$0
Total Estimated Project Cost			\$618,014,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

14/Federal cost includes \$130,000 for Independent External Peer Review that is part of the total project cost, but is not to be cost shared with the local sponsor.

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

CERP Caloosahatchee River (C-43) West Basin Storage Reservoir

Estimated Federal Cost (CoE)		\$388,549,000
Programmed Construction	\$388,549,000	
Un-programmed Construction	\$0	
Estimated Federal Cost (OFA)		\$27,504,000
Programmed Construction	\$27,504,000	
Un-programmed Construction	\$0	
Estimated Total Federal Cost		\$416,053,000
Programmed Construction	\$416,053,000	
Un-programmed Construction	0	
Estimated Non-Federal Cost		\$416,053,000
Programmed Construction	\$416,053,000	
Cash Contributions	\$341,087,000	
Other Costs	\$74,966,000	
Un-programmed Construction	\$0	
Cash Contributions	\$0	
Other Costs	\$0	
Total Estimated Programmed Construction Cost		\$961,284,000
Total Estimated Un-programmed Construction Cost		\$0
Total Estimated Project Cost		\$832,106,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

Kissimmee River Lower Basin

Estimated Federal Cost (CoE) 17/			\$314,132,000
Programmed Construction	\$314,132,000		
Un-programmed Construction	0		
Estimated Federal Cost (OFA)			\$0
Programmed Construction	\$0		
Un-programmed Construction	\$0		
Estimated Total Federal Cost			\$314,132,000
Programmed Construction	\$314,132,000		
Un-programmed Construction	\$0		
Estimated Non-Federal Cost			\$277,650,000
Programmed Construction	\$277,650,000		
Cash Contributions	\$83,027,000		
Other Costs	\$194,623,000		
Un-programmed Construction	\$0		
Cash Contributions	\$0		
Other Costs	\$0		
Total Estimated Programmed Construction Cost			\$584,388,000
Total Estimated Unprogrammed Construction Cost			\$0
Total Estimated Project Cost			\$591,782,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

17/ Federal cost for the Lower Basin includes \$51,000 for Independent External Peer Review which is included in the total project cost, but is not to be cost shared with the local sponsor.

SUMMARIZED FINANCIAL DATA – Separable Elements (Continued)

Kissimmee River Upper Basin

Estimated Federal Cost (CoE) 18/ Programmed Construction	\$58,404,000	\$58,404,000
Un-programmed Construction	\$ 0	
Estimated Federal Cost (OFA) Programmed Construction	\$0	\$0
Un-programmed Construction	\$0	
Estimated Total Federal Cost Programmed Construction	\$58,404,000	\$58,404,000
Un-programmed Construction	\$0	
Estimated Non-Federal Cost Programmed Construction	\$115,842,000	\$115,842,000
Cash Contributions	\$5,600,000	
Other Costs	\$110,242,000	
Un-programmed Construction	\$0	
Cash Contributions	\$0	
Other Costs	\$0	
Total Estimated Programmed Construction Cost		\$174,246,000
Total Estimated Un-programmed Construction Cost		\$0
Total Estimated Project Cost		\$174,246,000

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable

TOTAL BENEFIT-COST RATIO: Not applicable

18/ Kissimmee project cost shared 50/50. Federal cost for the Upper Basin includes \$50,000 for Independent External Peer Review which is included in the total project cost, but is not to be cost shared with the local sponsor.

APPROPRIATION TITLE: Construction - Channels and Harbors (Navigation), Fiscal Year 2018

PROJECT: Savannah Harbor Expansion, Georgia (Continuing)

LOCATION: The Savannah Harbor is a 33-mile long, 42-foot deep shipping channel along the Savannah River that separates Chatham County, Georgia to the south and Jasper County, South Carolina to the north. The Georgia Ports Authority (GPA) operates the Garden City Ocean Terminal facility located 19.5 miles upstream from the Atlantic Ocean.

DESCRIPTION: The project will involve deepening Savannah Harbor to 47 feet. This will require dredging and subsequent placement of 24 million cubic yards of sediments. Approximately 13 million cubic yards of sediment will be dredged from the Inner Harbor (Garden City Terminal from Stations 103+000 to 0+000) and deposited in existing upland Dredge Material Containment Areas (DMCAs) and about 11 million cubic yards of sediment would be dredged from the Entrance Channel (Stations 0+000 to -97+680B) and deposited in the Ocean Dredged Material Disposal Site (ODMDS) or an existing DMCA. Dike raising of DMCAs would be performed to provide disposal capacity used for the deepening new work materials within the footprint of the existing DMCAs. All work is programmed; however, no funding is included in the Summarized Financial Data to implement Section 1319 of the Water Infrastructure Improvements for the Nation Act. The total cost of the project is shared 75 percent Federal and 25 percent non-Federal, except for Navigation Aids (\$5,902,000) that will be funded by the U.S. Geological Survey and dredging of non-Federal berths (\$3,306,000) that will be funded at 100 percent non-Federal expense. Specifically, the construction involves the following:

- a. Channel Deepening: Extending the existing entrance channel 7.1 miles from Stations -60+000B to -97+680B and deepening to -49 feet MLLW from the new ocean terminus to Station -14B+000B, then deepening to -47 feet MLLW from Station -14B+000B to Station 0+000 and, deepening the inner harbor to -47 feet MLLW from Station 0+000 to 103+000;
- b. Bend Wideners: Widening bends on the entrance channel at one location (Stations -23+000B to -14+000B) and in the inner harbor channel at two locations; (Stations 27+700 to 31+500, and Stations 52+250 to 55+000);
- c. Meeting Lanes: Constructing two meeting areas (Stations 14+000 to 22+000 and Stations 55+000 to 59+000);
- d. Turning Basin: Deepening and enlarging the Kings Island Turning Basin to a width of 1,600 feet;
- e. DMCA: Restoring dredged material volumetric capacity in existing DMCAs;
- f. Mitigation: The mitigation plan includes: 1) Construction of a fish bypass around the New Savannah Bluff Lock and Dam in Augusta, Georgia [; 2) Construction of a series of flow re-routing features in the estuary to include a diversion structure, cut closures, removal of a tidegate structure, and construction of a rock sill and submerged sediment berm; 3) Acquisition and preservation of 2,245 acres of wetlands; 4) Restoration of approximately 29 acres of tidal brackish marsh; 5) Installation of an oxygen injection system; 6) Construction of a raw water storage impoundment for the City of Savannah, Georgia industrial and domestic water treatment facility; 7) Construction of a boat ramp; 8) One-time payment to Georgia Department of Natural Resources (GA DNR) for a Striped bass stocking program; 9) Removal and recovery of the remains of a Civil War ironclad; 10) Up to ten years of monitoring of the mitigation features; and, 11) Adaptive management to modify features if necessary.

AUTHORIZATION: Section 101(b) (9) of Water Resources Development Act (WRDA) 1999, and Section 7003 (1) of Water Resources Reform and Development Act (WRRDA) 2014, dated 15 May 2014

REMAINING BENEFIT-REMAINING COST RATIO: 5.4 to 1 at 7.0 percent

TOTAL BENEFIT-COST RATIO: 3.6 to 1.0 at 7.0 percent

INITIAL BENEFIT-COST RATIO: 3.3 to 1 at 7.0 percent (FY 2014)

BASIS OF BENEFIT-COST RATIO: Chief's Report, dated 17 August 2012, at 1 Oct 2012 price levels; Post Authorization Change Report dated November 10, 2016.

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Appropriation Requirement (CoE)		\$766,560,500	NAVIGATION		
			Inner Harbor Channel	0	TBD
Estimated Appropriation Requirement (USCG)		\$ 5,902,000	Turns and Bends		
			Kings Island Turning Basin		
			Long Island Meeting Area		
Estimated Total Appropriation Requirement		\$772,462,500	Oglethorpe Meeting Area		
Future Non-Federal Reimbursement		\$101,100,000	Outer Harbor Channel	50	TBD
			14A/B Dike Raise	60	TBD
Estimated Federal Cost (Ultimate)		\$671,362,500	Final Dike Raises	0	TBD
Estimated Non-Federal Cost		\$357,367,500	MITIGATION		
			Raw Water Storage Impoundment	65	TBD
Cash Contributions		\$276,437,00	Fish Bypass at NSBLD	0	TBD
LERRDs		\$ 211,000	CSS <i>Georgia</i>	80	TBD
Reimbursements		\$77,413,500	Dissolved Oxygen Plants	25	TBD
Navigation		\$3,306,000	Flow Re-Routing	0	TBD
			McCoy's Cut & Rifle Cut	0	TBD
Total Estimated Project Cost		\$1,028,730,000	Diversion Structure		
Authorized Cost (plus inflation)		\$1,028,730,000	Rock Sill & Broad Berm Fill	0	TBD
Maximum Cost Limit (Section 902)		\$894,402,000	Tide Gate Removal	20	
			Embankment Removal	20	
			Boat Ramp	0	
			Marsh Restoration	0	TBD
			MONITORING		
			Pre-Construction	100	7 Oct 2014
			During Construction	20	TBD
			Post-Construction	0	TBD
			ADAPTIVE MANAGEMENT		
			Entire Project	15	TBD

Division: South Atlantic

District: Savannah

Savannah Harbor Expansion, GA

SUMMARIZED FINANCIAL DATA (continued)	ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PHYSICAL PCT COMPLETION	
			CMPL	SCHEDULE
Allocations to 30 September 2014	\$22,409,000			
Allocation for FY 2015	\$24,020,000			
Allocation for FY 2016	\$48,370,000			
Allocation for FY 2017	\$42,950,000	5/		
Allocations through FY 2017	\$137,749,000	1/ 2/ 3/ 6/		
Estimated Unobligated Carry-In Funds	\$0	4/		
President's Budget for FY 2018	\$50,060,000			
Programmed Balance to Complete after FY 2018	\$578,751,150			
Unprogrammed Balance to Complete after FY 2018	0	7/		

1/ \$9,254,000 reprogrammed to the project: \$3,254,000 during PED phase and \$6,000,000 during Construction phase. Previous J-sheets reported this figure incorrectly at \$6,759,510.

2/ (\$19,000) rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 into FY 2017 was \$1,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ The amount shown includes \$250,000 provided in Further Continuing and Security Assistance Appropriations Act, 2017, P.L. 114-254, December 2016).

6/ PED costs of \$22,409,000 are included in this amount. Previous J-sheets reported this incorrectly as \$23,028,000.

7/ While the costs have not yet been calculated, funding to implement the recently authorized Section 1319 of the Water Infrastructure Improvements for the Nation Act is currently unprogrammed.

PHYSICAL DATA: The Savannah Harbor Expansion project consists of the following features:

REAL ESTATE:

- Acquire 2,397 acres for project feature construction and mitigation.

NAVIGATION, PORTS & HARBORS:

- Deepen the approximately 38 miles of navigation channel
- Bend Wideners: Widen the channel at 3 bends: Jones Island Range to the north; Lower Flats Range to the north; Fort Jackson Range to the north.
- Meeting Areas: Long Island Meeting Area - 8,000 foot; Oglethorpe Meeting Area - 4,000 foot
- Turning Basin: Deepen and enlarge Kings Island Turning Basin to 1,600 feet x 1,600 feet.
- DMCA: Restore confined dredged material containment capacity in existing containment areas (15 Million Cubic Yards (MCYs)).

CULTURAL RESOURCES PRESERVATION:

- CSS *Georgia* Civil War Ironclad removal, recovery, conservation and curation.

FISH & WILDLIFE FACILITIES:

- New Savannah Bluff Lock & Dam Fish Bypass.
- Flow re-routing features: a diversion structure, cut closures, removal of a Tide Gate structure, and construction of a rock sill and submerged sediment berm.
- Raw Water Storage Impoundment, 97 million gallon capacity.
- Construct a boat ramp and restore embankment at the location of the Tide Gate removal site.
- Restore approximately 29 acres of tidal brackish marsh.
- Construct two dissolved oxygen injection system plants, one near Georgia Power's Plant McIntosh and one on Hutchinson Island.
- Payment to GA DNR for Striped bass stocking.

MITIGATION MONITORING & ADAPTIVE MANAGEMENT:

- Pre-Construction Monitoring for 1 year.
- Monitoring During Construction for approximately 84 months.
- Post-Construction Monitoring for 10 years.
- Adaptive management to modify features during and after construction.

JUSTIFICATION: The project supports national goals to improve navigation and infrastructure along U.S. east coast ports needed as a result of the expansion of the Panama Canal with the maximum allowable draft increased from -40 to -50 feet, thereby allowing larger Post-PanaMax (PPM) vessels to transit the Canal and call on U.S. east coast ports. PPM vessels carry up to three times the cargo of ships currently transiting the Panama Canal from 4,800 Twenty-Foot Equivalent Units (TEUs) to 12,600 TEUs per ship. Currently, PPM vessels requiring a drafting capability of more than -42-feet must transit the 33-mile Savannah Harbor channel during high tide windows created by the river's 7-foot tides. As the frequency of these PPM vessels increases, transportation inefficiencies, vessels waiting on the tide and light loading practices, will steadily increase unless the Savannah Harbor channel is deepened. Currently, nearly one-third of the vessels that call on Garden City Ocean Terminal are PPM. The Port of Savannah is the 4th largest container port in the United States (U.S.) and the fastest growing container port in the Nation for the last 10 years. The Garden City Ocean Terminal along the Savannah River Channel must be prepared to accept PPM vessels

without current limitations of light loading practices and movement only during high tides. Major imports include retail consumer goods, machinery, appliances and electronics, major exports include kaolin clay, chemicals, fabrics, resins and rubber, forest and agricultural products and manufactured equipment.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be applied as follows:

Construct Entrance Channel Dredging	\$35,797,000
Continue Environmental Monitoring	\$4,000,000
Construction Management	\$1,914,000
Engineering During Construction	\$990,000
Total	\$42,701,000

FISCAL YEAR 2018: The budget amount will be applied as follows:

Continue Entrance Channel Dredging	\$21,500,000
Dissolved Oxygen Verification Testing	\$2,000,000
Construct McCoys Cut Area Work	\$22,560,000
Continue Environmental Monitoring	\$4,000,000
Total	\$50,060,000

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsor must comply with the requirements listed below:

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Provide lands, easements, rights of way, and dredged material disposal areas.	\$211,000	\$0
Pay approximately 25 percent of the costs allocated to general navigation facilities during construction.	\$276,437,000	\$0
Reimburse an additional 10 percent of the cost of general navigation features allocated to commercial navigation within a period of 30 years following completion of construction, as may be reduced by credit allowed for the value of lands, easements, rights of way, relocations, and dredged material disposal areas provided for commercial navigation.	\$80,719,500	\$0
Annual O & M - Dissolved Oxygen Plants and Channel Extension		\$5,400,000
Total Non-Federal Costs	\$357,367,500	\$151,000

The non-Federal sponsor has also agreed to make all required payments concurrently with project construction.

Division: South Atlantic

District: Savannah

Savannah Harbor Expansion, GA

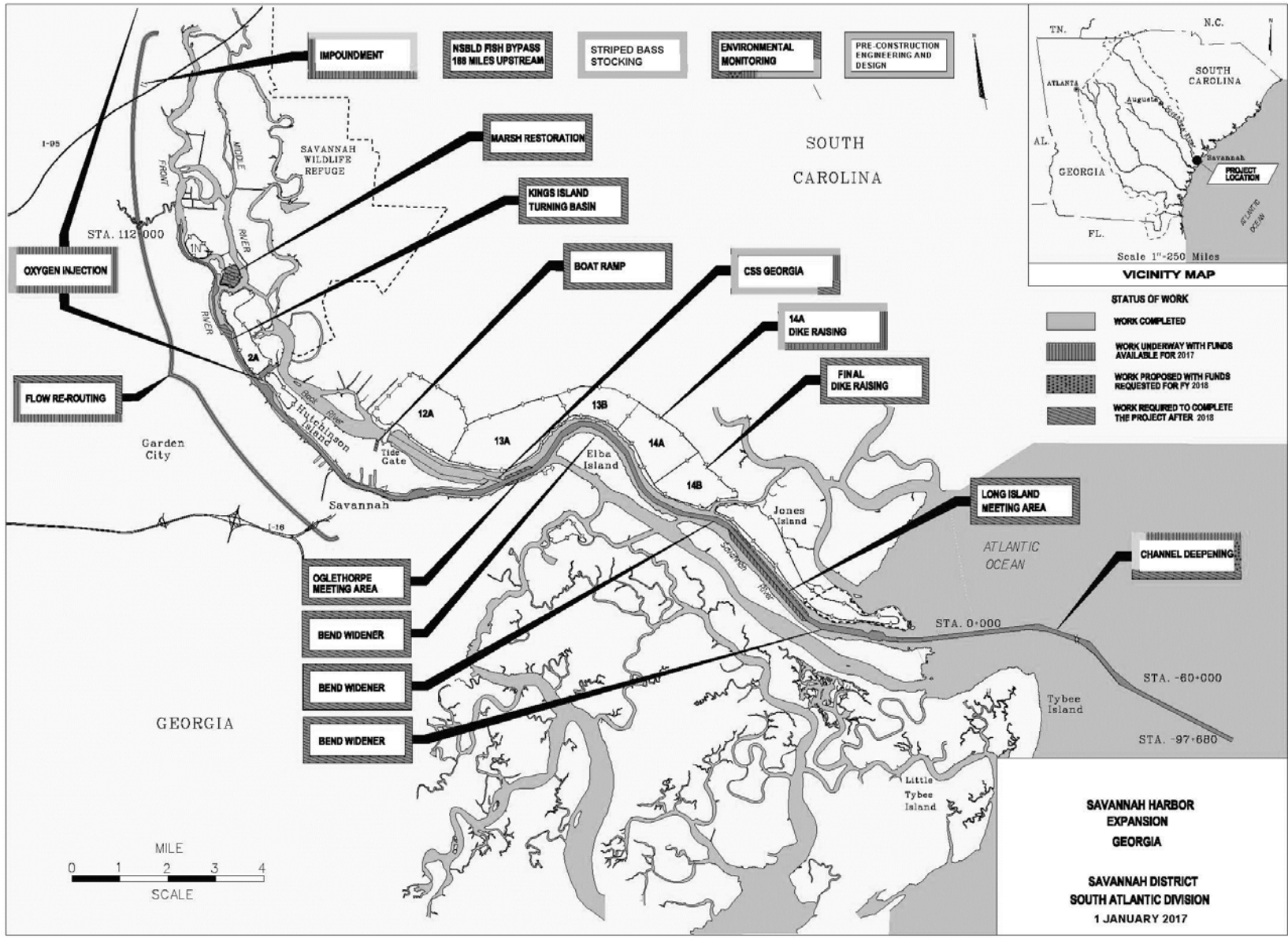
STATUS OF LOCAL COOPERATION: The GPA and the Georgia Department of Transportation (GDOT) are the Construction Phase sponsors. A Construction Project Partnership Agreement was executed 8 October 2014 which allows the Non-Federal Sponsors to immediately provide their funds, up to the current estimate of the Non-Federal Sponsors' share, to start of construction. The sponsor funding and credit to date totals \$269,685,000 (\$190,000,000 of this provided in October 2014 and another \$30,000,000 provided in March 2016). The sponsors provided the remainder of their estimated share of the Total Project Cost Escalated to the Mid-Point of Construction, \$58,200,000, during FY 2017. Sponsor funds will be exhausted in FY 2018 and are being used to initiate and complete the CSS *Georgia* Recovery; initiate Entrance Channel Dredging; initiate and complete the Dissolved Oxygen Injection System construction; initiate and complete the DMCA 14A Dike Raising; and initiate the Raw Water Storage Impoundment construction.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal (Corps) cost estimate of \$766,560,500 is an increase of \$223,815,500 from the latest estimate (\$542,745,000) presented to Congress (FY2017). This change includes the following items.

Item	Amount
Price Escalation on Construction Features	\$223,565,500
Other Estimating Adjustments (Hurricane Matthew)	\$ 250,000
Total	\$223,815,500

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: A Record of Decision was issued on 26 October 2012.

OTHER INFORMATION: None.



Division: South Atlantic

District: Savannah

Savannah Harbor Expansion, GA

APPROPRIATION TITLE: Construction – Locks and Dams (Navigation), Fiscal Year 2018

PROJECT: Olmsted Locks and Dam, Illinois and Kentucky (Continuing)

LOCATION: The project is located in Pulaski County, Illinois, and Ballard County, Kentucky, on the Ohio River near Olmsted, Illinois, approximately 964 miles downstream from Pittsburgh, Pennsylvania.

DESCRIPTION: Per the Chief's Report dated November 4, 1987, the project will replace Ohio River Locks and Dams 52 and 53. The new structure will consist of two 110 foot by 1200 foot locks adjacent to the Illinois shore and a dam comprised of tainter gates, navigable pass, and a fixed weir. All work is programmed. This project is evenly cost shared between general appropriations and the Inland Waterways Trust Fund through the end of Fiscal Year (FY) 2013. In FY 2014, the cost share was 75 percent and 25 percent. Beginning in FY 2015, the project is cost shared 85 percent and 15 percent between general appropriations and the Inland Waterways Trust Fund.

AUTHORIZATION: Section 3(a) (6) of WRDA 1988 (P.L. 100-676) as amended by Section 2006(a) (2) of WRRDA 2014 (P.L. 113-121) and H.R.2775 - Continuing Appropriations Act, 2014

REMAINING BENEFIT – REMAINING COST RATIO: 25.5 to 1 at 7 percent.

TOTAL BENEFIT – COST RATIO: 3.4 to 1 at 7 percent.

INITIAL BENEFIT – COST RATIO: 2.8 at 8 3/4 percent (FY 1991).

BASIS OF BENEFIT – COST RATIO: Benefits are based on the Olmsted Locks and Dam Post Authorization Change Report, dated Nov 2011 and revised in May 2016.

SUMMARIZED FINANCIAL DATA		STATUS (1 Jan 2017)	PERCENT COMPLETE	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost	\$3,059,266,000	Entire Project	83	TBD
General Appropriations	\$2,014,241,000			
Inland Waterways Trust Fund	\$1,045,025,000			
Estimated Non – Federal Cost	0			
Total Estimated Project Cost	\$3,059,266,000			
Authorized Cost (plus inflation)	\$2,975,576,000			
Maximum Cost Limit (Section 902)	\$3,559,176,000			

SUMMARIZED FINANCIAL DATA (Continued):

	GENERAL APPNS	INLAND WATERWAYS TRUST FUNDS	ACCUM. PCT. OF EST. FED COST
Allocations to 30 September 2013	849,248,000	819,732,000 5/	54
Allocations for FY 2014	124,106,000	41,606,000 6/	59
Allocations for FY 2015	180,804,000	31,907,000	66
Allocation for FY 2016	227,800,000	40,200,000	75
Allocation for FY 2017	212,500,000	37,500,000	83
Allocations through FY 2017	1,594,458,000	970,945,000 1/2/3/4/	83
Estimated Unobligated Carry-in Funds	0	0 4/	
President's Budget for FY 2018	148,750,000	26,250,000	89
Programmed Balance to Complete after FY 2018	271,033,000	47,830,000	
Unprogrammed Balance to Complete after FY 2018	0	0	

1/ \$7,410,000 reprogrammed to the project. (\$2,000,000 from Locks and Dam 2, 3, and 4 Monongahela River in July 2014; \$4,900,000 from the additional funding for Hydropower provided in September 2015; \$510,000 from McAlpine in September 2015)

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

Division: Great Lakes and Ohio River

District: Louisville

Olmsted Locks and Dam, IL & KY

4/ Unobligated Carry-in Funding: The actual unobligated balance from FY 2016 into FY 2017 (3011A report) for this project was \$2,796,612, \$721,955 of which was committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$13,023,000 are included in this amount.

6/ P.L. 113-121, Water Resources Reform and Development Act of 2014, provided that for each fiscal year beginning after September 30, 2014, 15 percent of proposed funding will be derived from the Inland Waterways Trust Fund..

PHYSICAL DATA:

Lock – 110 by 1,200 foot Chambers	2
Dam – Navigable Pass	1,400 feet
Fixed Weir	561 feet
Tainter Gates	744 feet
Acres – Dam	123 acres
Road	21 acres
Disposal Area	114 acres

JUSTIFICATION: The project is in a strategic location on the inland waterway system. Virtually all waterway traffic moving between the Ohio River and tributaries and the Mississippi River and tributaries passes through the project area. Olmsted Locks and Dam will replace existing Ohio River Locks and Dams 52 and 53, which are over 83 years old. Both projects have temporary lock chambers that are inefficient and neither project conforms to current design criteria for structural stability. Commercial navigation in 2011 was 91 million tons through Lock 52 and 81 million tons through Lock 53. Over the last five years, tonnage has been relatively constant, with the 5 year average of 88 million tons through Lock 52 and 77 million tons through Lock 53. The long term (2010-2030) average annual growth rate is projected to be between 0.9 and 1.1 percent. Coal comprises approximately 39 percent of the total tonnage, petroleum 4 percent, crude materials 31 percent, farm products 13 percent, chemicals 10 percent and 3 percent others/misc. The projected increases in waterway traffic demands in combination with the limited capacity of the existing locks will result in increased lockage delays. The Net Annual Project Benefits are \$588 million.

The following counties qualify as areas of "substantial and persistent" unemployment: Illinois – Alexander, Johnson, Massac, Pope, Pulaski, and Union; Kentucky – Ballard, Carlisle, Graves, Livingston, and Marshall.

Net annual benefits at 7 percent in 2016 price levels are as follows:

Annual Benefits	Amount
Navigation	\$588,297,000
Total	\$588,297,000

FISCAL YEAR 2017: The appropriated amount, plus carry-in, will be applied as follows:

Continue Dam Construction Contract	\$222,796,612
Mussel Monitoring	450,000
Planning, Engineering, and Design	4,500,000
Construction Management	8,000,000

Division: Great Lakes and Ohio River

District: Louisville

Olmsted Locks and Dam, IL & KY

Lock O&M during Construction (Hired Labor)	2,000,000
River Dikes	8,000,000
Operation Buildings	7,050,000
Total	\$252,796,612

FISCAL YEAR 2018: The budgeted amount will be applied as follows:

Continue Dam Construction Contract	\$110,000,000
Mussel Monitoring	500,000
Planning, Engineering, and Design	5,000,000
Construction Management	8,000,000
Lock O&M during Construction (Hired Labor)	4,000,000
River Dikes	40,000,000
Operation Buildings	7,500,000
Total	\$175,000,000

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act (WRDA) of 1986, 50 percent of the total cost of construction was derived from the Inland Waterways Trust Fund (IWTF) except in FY14 when the IWTF cost share was set at 25 percent by the Consolidated Appropriations Act, 2014. P.L. 113-121, Water Resources Reform and Development Act of 2014, provided that for each fiscal year beginning after September 30, 2014, 15 percent of proposed funding will be derived from the Inland Waterways Trust Fund. Funds allocated under the American Reinvestment and Recovery Act are not subject to the cost sharing provisions of WRDA 1986.

STATUS OF LOCAL COOPERATION: None required.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$3,059,266,000 is a decrease from the latest estimate (\$3,093,708,000) presented to Congress (FY 2016). The change includes the following items.

Items	Amount
Price De-escalation on Construction Features	\$34,442,000
Total	\$34,442,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: A final Environmental Impact Statement (EIS) was filed with the Environmental Protection Agency on April 4, 1986. Due to project changes, a Draft Supplemental EIS was filed in November 1991. The Final Supplement to the EIS was filed on March 26, 1993, and the Record of Decision was signed on May 5, 1993.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY 1986. Funds to initiate construction were
 Division: Great Lakes and Ohio River District: Louisville Olmsted Locks and Dam, IL & KY

appropriated in FY 1991. The twin 110 x 1200-foot locks were substantially completed in 2005. Construction on the dam was initiated in Jan 2004. Demolition of Locks and Dams 52 and 53 will follow completion of dam construction. A Post Authorization Change Report has been approved and submitted to Congress. The H.R. 2775 – Continuing Appropriations Act of 2014 included a provision to increase the authorized cost of Olmsted to \$2,918,000,000.

APPROPRIATION TITLE: Construction – Environmental Mitigation, Restoration, and Protection, Fiscal Year 2018

PROJECT: Upper Mississippi River Restoration, Illinois, Iowa, Minnesota, Missouri, and Wisconsin (Continuing)

LOCATION: The project is authorized for those river reaches having commercial navigation channels on the Upper Mississippi River, Illinois River, Minnesota River, St. Croix River, and Kaskaskia River in the states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The following counties are included: (Illinois) Jo Daviess, Carroll, Whiteside, Rock Island, Mercer, Henderson, Hancock, Adams, Pike, Calhoun, Jersey, Madison, St. Clair, Monroe, Randolph, Jackson, Union, Alexander, Pulaski, Brown, Cass, Schuyler, Fulton, Mason, Peoria, Tazewell, Woodford, Marshall, Putnam, Bureau, LaSalle, Grundy, Will; (Iowa) Allamakee, Clayton, Dubuque, Jackson, Clinton, Scott, Muscatine, Louisa, Des Moines, Lee; (Wisconsin) St. Croix, Pierce, Pepin, Buffalo, Trempealeau, La Cross, Vernon, Crawford, Grant; (Minnesota) Anoka, Hennepin, Scott, Dakota, Ramsey, Washington, Goodhue, Wabasha, Winona, Houston; (Missouri) Clark, Lewis, Marion, Ralls, Pike, Lincoln, St. Charles, St. Louis, Jefferson, Ste. Genevieve, Perry, Cape Girardeau, Scott, Mississippi.

DESCRIPTION: The purpose of the Upper Mississippi River Restoration (UMRR) program is to address adverse impacts to the aquatic ecosystem of the Upper Mississippi River, which were caused by many factors, including changes in the river due to construction and maintenance of the inland navigation system. The UMRR Program is a continuing authority program, as amended by WRDA of 1999. Projects are designed to help preserve and improve fish and wildlife habitat on the Upper Mississippi River System (UMRS) and counteract the effects of backwater sedimentation through dike construction to limit sedimentation of prime habitat and dredging to restore aquatic habitat; provide water level control and optimal food growth for waterfowl; decrease wind generated disturbances, thereby reducing turbidity; alter the flow of water to side channels and backwaters to decrease flows of sediment-laden water during high water and to increase dissolved oxygen levels during low water; and increase the diversity and abundance of mast (nut) producing trees and prairies to benefit wildlife. Long-Term Resource Monitoring provides scientific information for more informed management of the UMRS ecosystem. The cost of projects implemented under this program is either funded at 100 percent Federal expense or is shared with a non-Federal sponsor, and the cost-share percentage has varied over time from the original 25 percent to the current 35 percent (See Non-Federal Costs).

AUTHORIZATION: Fiscal Year 1985 Supplemental Appropriations Act, P.L. 99-88; Water Resources Development Act (WRDA) of 1986, PL 99-662, Section 1103; WRDA of 1990, P.L. 101-640, Section 405; WRDA of 1992, P.L. 102-580, Section 107; WRDA of 1999, P.L. 106-53, Section 509; and the WRDA of 2007, P.L. 110-114, Section 3177.

REMAINING BENEFIT-REMAINING COST: The remaining benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

TOTAL BENEFIT-COST RATIO: The total benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms. Projects within the Upper Mississippi River Restoration project are selected for design and construction based on continued assessment of habitat restoration and enhancement opportunities as determined by the involved Federal and non-Federal partners.

INITIAL BENEFIT-COST RATIO: The initial benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: The basis for the benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI

SUMMARIZED FINANCIAL DATA

ACCUM
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COST

STATUS
(Mar 2017)

Estimated Federal Cost		\$ 1,141,912,000		Status in project listing
Programmed Construction	\$1,137,602,000			
Unprogrammed Construction	\$ 4,310,000			
Estimated Non-Federal Cost		26,066,000		
Programmed Construction	\$ 26,066,000			
Cash Contribution				
Other Costs	0			
Unprogrammed Construction	0			
Total Estimated Programmed Construction Cost		\$ 1,163,668,000		
Total Estimated Unprogrammed Construction Cost		\$ 4,310,000		
Total Estimated Project Cost		\$1,167,978,000		
Authorized Cost (plus inflation)		N/A		This program is subject to an annual appropriation limit of
Maximum Cost Limit (Section 902)		N/A		\$33,170,000.
Allocations to 30 September 2014		\$476,603,000	1/2/3/4/	
Allocations for FY 2015		\$ 33,170,000		
Allocation for FY 2016		21,174,000		
Allocations for FY 2017		33,165,000	5/	
Allocations through FY 2017		564,112,000	6/	50
Estimated Unobligated Carry-in Funds		0	5/	
President's Budget for FY 2018		33,170,000		52

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI

Programmed Balance to Complete After FY 2018	540,320,000	
Unprogrammed Balance to Complete After FY 2018	\$4,310,000	7/

1/ Allocations include Supplemental Appropriations

2/ \$3,373,309 reprogrammed to the project.

3/ \$626,182 rescinded from the project.

4/ Includes ARRA funding of \$14,847,000 in FY 2009; (\$918,000) in FY 2010; (\$8,000) in FY 2011; (\$315,000) in FY 2012; and (\$107,000) in 2013.

5/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$132,000, including \$1,000 of committed within in the Corps for scheduled ongoing requirements in FY2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this effort is \$0.

6/ \$0 transferred to the Flood Control and Coastal Emergencies account.

7/ This work is un-programmed pending a decision to construct these features.

JUSTIFICATION: Implementation of the UMRR program is essential to the continued viability of the ecosystem of the Upper Mississippi River. Habitat rehabilitation and enhancement projects help reduce the negative effects of navigation features on the system's backwater and side channels. Projects are selected for design and construction based on continued assessment of habitat restoration and enhancement opportunities as determined by the involved Federal and non-Federal partners and following the project sequencing process adopted in 2003. Long-Term Resource Monitoring provides data to indicate trends in key environmental parameters and analyzing sedimentation and other UMRS resource problems.

FISCAL YEAR 2017 and 2018: While amounts between projects may be adjusted within the total program in response to changed conditions and consistent with priorities and capability, the total FY 2017 appropriations amount, plus carry-in, and the FY 2018 budgeted amount will be applied as follows:

Feasibility Studies:

<i>State</i>	<i>Site</i>	<i>Project</i>	<i>FY 2017 Funding</i>	<i>FY 2017 Description</i>	<i>FY 2018 Funding</i>	<i>FY 2018 Description</i>	<i>Status (Mar 2017) % Complete</i>	<i>Scheduled Completion 8/</i>
IA	8	Beaver Island, IA	250,000	Complete Feasibility			85	(Aug 17)
IL	25	Delair Division, IL	250,000	Continue Feasibility	275,000	Continue Feasibility	5	(Feb 20)
MO	35	Harlow Island, MO	75,000	Continue Feasibility	275,000	Continue Feasibility	8	(Sep 20)
IL	40	Keithsburg Division, IL	310,000	Continue Feasibility	305,000	Continue Feasibility	60	(Sep 19)
WI	43	Lake Winneshiek, WI	75,000	Continue Feasibility	75,000	Continue Feasibility	10	(Sep 20)
IA	48	Lower Pool 10 Islands, IA	50,000	Continue Feasibility	395,000	Continue Feasibility	3	(Nov 20)
WI	49	McGregor Lake, WI	200,000	Continue Feasibility	225,000	Complete Feasibility	100	(Nov 17)
IL	55	Piasa and Eagles Nest Islands, IL	245,735	Continue Feasibility	285,000	Continue Feasibility	15	(Mar 20)
IL	72	Rip Rap Landing, IL	50,000	Continue Feasibility	69,000	Continue Feasibility	15	(Aug 21)
IA	79	Steamboat Island, IA	200,000	Continue Feasibility	125,000	Continue Feasibility	10	(Apr 20)
IA	84	Turkey River Bottoms, IA/WI	22,000	Continue Feasibility	100,000	Continue Feasibility	1	(Jan 21)
MN	85	Weaver Bottoms, MN	51,000	Initiate Feasibility	75,000	Continue Feasibility	2	(Sep 21)
IL	91	Crain's Island	375,000	Initiate Feasibility	300,000	Complete Feasibility	60	(Sep 18)
IL	92	Oakwood Bottoms	50,000	Initiate Feasibility	350,000	Continue Feasibility	5	(Nov 20)

Design and Construction:

<i>State</i>	<i>Site</i>	<i>Project</i>	<i>FY 2017 Funding</i>	<i>FY 2017 Description</i>	<i>FY 2018 Funding</i>	<i>FY 2018 Description</i>	<i>Status (Mar 2017) % Complete</i>	<i>Federal Balance to Complete after FY 2018</i>	<i>Scheduled Completion</i>
IA	8	Beaver Island, IA	129,951	Initiate Design	6,747,000	Complete Design/Initiate Construction	0	\$18,161,022	(Sep 23)
WI	16	Capoli Slough, WI	24,000	Complete and Closeout Project			100	0	(Sep 17)
MO	18	Clarence Cannon NWR, MO	7,000,000	Continue Construction	5,425,000	Continue Construction	30	\$17,126,786	(Dec 22)
IA	22	Conway Lake, IA	8,582,214	Complete Design & Initiate Construction	1,150,000	Continue Construction	45	\$10,255,317	(Dec 20)
IA	36	Harpers Slough, IA	300,000	Continue Construction	84,000	Complete and Closeout Project	98	0	(Sep 18)
IA	37	Huron Island, IA (Stage II)	200,000	Continue Construction	100,000	Continue Construction	5	\$0	(Sep 21)
IA	37	Huron Island, IA (Stage III)	150,000	Continue Construction	150,000	Continue Construction	0	\$400,000	(Sep 21)
IL	41	Lake Odessa, IL	78,000	Complete and Closeout Project			100	0	(Sep 17)
WI	49	McGregor Lake, WI			5,200,000	Initiate/Complete Design and Initiate Construction	10	\$500,000	(May 22)
IL	59	Pool 12, IL (Stage II)	600,000	Continue Construction	275,000	Complete and Closeout Project	70	0	(May 20)
IL	59	Pool 12, IL (Stage III)	1,700,000	Continue Construction	300,000	Continue Construction	30	\$200,000	(Sep 20)
IL	70	Rice Lake, IL	75,000	Complete and Closeout Project			95	0	(Sep 17)
MO	61	Pool 25 and 26, MO	100,000	Complete and Closeout Project			100	0	(Sep 17)
MO	82	Ted Shanks, MO	500,000	Continue Construction	500,000	Continue Construction	91	\$500,000	(Oct 20)

Other:

<i>Project</i>	<i>FY 2017 Funding</i>	<i>FY 2018 Funding</i>	<i>Description</i>
Adaptive Management	200,000	150,000	Implementation of a regional adaptive management strategy to use scientific monitoring to promote lessons learned across all projects.
Habitat Evaluation/Monitoring	975,000	975,000	District Project Management, Project evaluation reports (PER) and Fish and Wildlife support to the district.
Long Term Resource Monitoring	4,610,000	4,725,000	Collection of base monitoring data by six biological monitoring stations, quality assurance and data processing for all samples collected.
Model Certification/ Regional HREP	100,000	100,000	Certification of new models needed for use in formulation of feasibility reports for HREP projects.
Public Outreach	75,000	75,000	
Regional Program Management	843,400	885,000	Regional program management including coordination (policy, fiscal and management) with Corps and ASA(CW) and the three Corps Districts and five states. This also includes development and maintenance of a regional program and project database, implementation of the strategic plan, regional meeting support as required by the authorizing legislation and development of the Report to Congress.
Regional Project Sequencing	100,000	300,000	Development of the habitat needs assessment and identification/evaluation and the prioritization of the next generation list of habitat projects.
Science in Support of Restoration/Management	3,500,000	3,175,000	Data collection, research and analysis in support of habitat restoration projects and policy development.
Total	33,296,000 9/	33,170,000	

8/ Scheduled completion dates are based on minimal execution delays and an efficient funding stream.

9/ Amount includes portion of carry-in from FY2016 in amount \$126,000; remaining carry-in of \$5,000 was Supplemental funds that were revoked in FY 2017. Also includes \$1,600 for North and Sturgeon Lakes, MN construction activity, which is now suspended.

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in Section 906(e) of the Water Resources Development Act of 1986 and amended by Section 509(e) and Section 221 of the Water Resources Development Act of 1999, the non-Federal sponsor must comply with the requirements listed below.

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation, and Replacement Costs
Pay 25 percent of the first costs allocated to fish and wildlife enhancement for the following projects:		
Baldwin Backwater, IL	624,000	
Banner Marsh, IL	1,780,000	
Batchtown, IL	200,000	
Blackhawk Park, WI	77,000	
Bussey Lake, IA	162,000	
Cuivre Island, MO	479,000	
Osborne Channel, IL 9/	190,000	
Peoria Lake, IL	1,072,000	
Princeton, IA	54,000	
Swan Lake, IL	262,000	
Subtotal	\$ 4,900,000	\$ 0
Pay 35 percent of the first costs allocated to fish and wildlife enhancement for the following projects		
Alton Pool Side Channel 9/	\$ 231,000	
Ambrough Slough, WI	166,000	
Emiquon, IL	7,779,000	
Horsesehoe Lake, IL 9/	2,037,000	
Kaskaskia Oxbows 9/	350,000	
Pool Slough, IA, MN	175,000	
Rice Lake, IL	7,280,000	
Smith Creek, IA	300,000	
Rip Rap Landing	2,848,000	
Subtotal	\$ 21,166,000	\$ 0
Total Non-Federal Construction Costs	\$ 26,066,000	\$ 0

9/ Inactive Projects

The non-Federal sponsors have agreed to make all required payments concurrently with project construction.

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI

STATUS OF LOCAL COOPERATION: A Project Agreement is required only for projects that are not located on lands managed as a national wildlife refuge.

COMPARISON OF FEDERAL COST ESTIMATE: The current Federal cost estimate of \$1,137,602,000 is an increase of \$25,790,000 from the latest estimate (\$1,111,812,000) presented to Congress (FY 2017) due to adjustments for inflation and design changes on unconstructed projects.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: National Environmental Policy Act compliance is accomplished prior to implementation of each individual project.

OTHER INFORMATION: Funds to initiate construction were appropriated in FY 1985. The Water Resources Development Act of 1999, P.L. 106-53, amends the previous authority to increase annual appropriation limits available to the project; requires submission of a report to Congress on a 6 year cycle which began in December 2004 to evaluate projects, accomplishments, systemic habitat needs, and identifies any needed changes to the project authorization; and authorized an independent technical review committee through FY 2009. To date the program has received \$4,987,732 in Supplemental Appropriations due to flood damages at the Odessa Habitat site.

This project was authorized in Section 1103, WRDA 1986 as amended in Section 405, WRDA 1990, Section 107, WRDA 1992, and Section 509, WRDA 1999, Section 3177, WRDA 2007 as the Upper Mississippi River System Environmental Management Program (Section 3177, WRDA 2007). Since 2006, this program has been budgeted and funds appropriated under the name Upper Mississippi River Restoration, IL, IA, MN, MO & WI.

The following projects have been delayed (inactive) due to prioritization or lack of a non-Federal sponsor:

<i>Project</i>	<i>Site</i>	<i>% Complete</i>	<i>Project</i>	<i>Site</i>	<i>% Complete</i>
Bass Ponds, Marsh, and Wetlands, MN	N/A	1	Pool 24 Island, MO	N/A	2
Boston Bay, IL	N/A	1	Pool 25 Island, MO	N/A	3
Clear Lake (Finger Lake Dredging), MN	N/A	1	Snyder Slough, WI	N/A	1
Glades Godar Wetlands, IL	N/A	2	West Alton Islands	N/A	2
Horseshoe Lake, IL	N/A	1	Wilkinson Island, IL	N/A	5
Kaskaskia River Oxbows, IL	N/A	1	Schenimann Chute, MO	N/A	15
Lock and Dam 3 Fish Passage, MN/WI	N/A	20	Emiquon, IL	N/A	30
North & Sturgeon Lakes, MN	N/A	30			

The following projects have been deferred and are not currently anticipated to be resumed.

<i>Project</i>	<i>Site</i>	<i>% Complete</i>
Alton Pool Side Channel, MO	N/A	2
Angle Blackburn Islands, MO	N/A	1
Baldwin Backwater Protection, IL	N/A	1
Norton Woods, MO	N/A	2
Osborne Side Channel, IL	N/A	3
Red's Landing Wetlands	N/A	2
Salt Lake/Ft Chartres S.C., IL	N/A	7
Sandy Chute, MO	N/A	2
Smith Creek, IA	N/A	1
Stone Dike Alteration, IL/MO	N/A	10
Turner Island & Chute, IL	N/A	2

The following projects are Unprogrammed projects and will not be initiated:

<i>Project</i>	<i>Site</i>	<i>% Complete</i>
Establishment Chute, MO	N/A	1
Jefferson Barracks Side Channel, IL	N/A	1
Least Tern, MO	N/A	5
Whitewater Dike, MN	N/A	0

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI

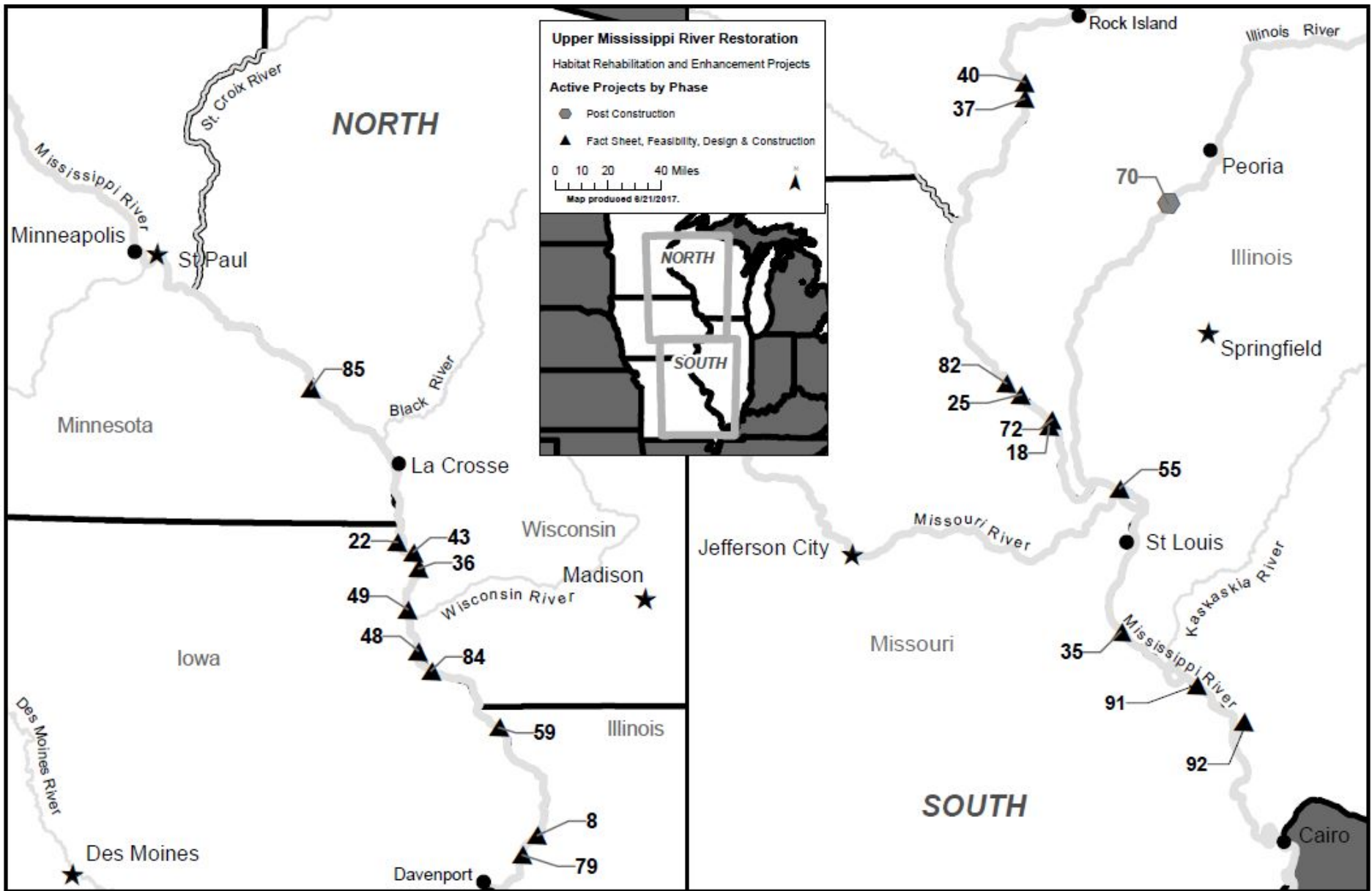
The following projects have been completed:

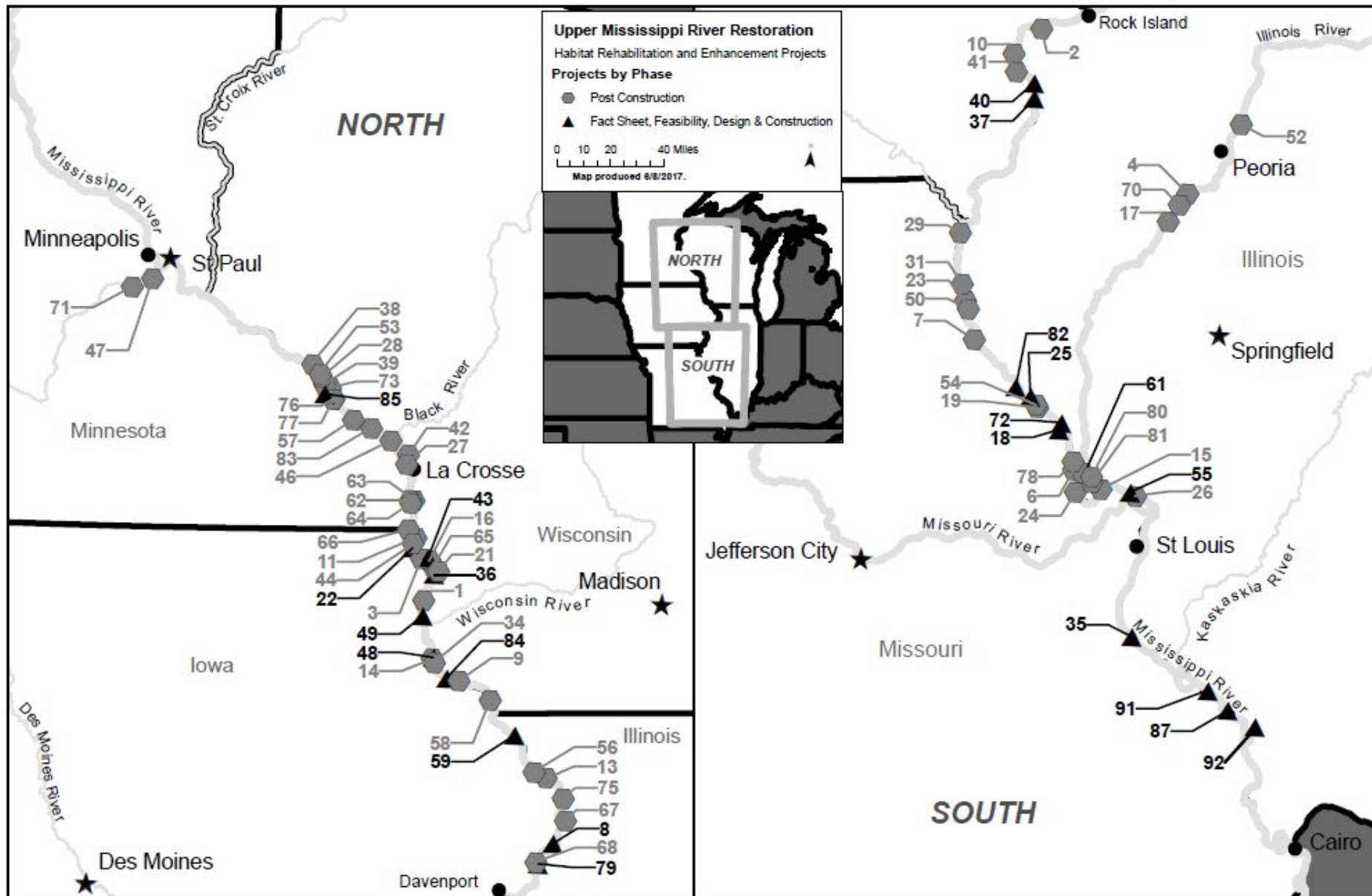
<i>Project</i>	<i>Site</i>	<i>Date of Completion</i>	<i>Project</i>	<i>Site</i>	<i>Date of Completion</i>
Ambrough Slough, WI	1	(Sep 04)	Long Meadow Lake, MN	47	(Nov 06)
Andalusia Refuge, IL	2	(Dec 94)	Monkey Chute, MO	50	(Aug 89)
Miss. River Bank Stabilization	3	(Sep 99)	Peoria Lake, IL	52	(Sep 97)
Banner Marsh, IL	4	(Dec 03)	Peterson Lake, MN	53	(Jun 96)
Batchtown Management Area, IL	6	(Aug 16)	Pharrs Island, MO	54	(Jun 92)
Bay Island, MO	7	(Nov 94)	Pleasant Creek, IA	56	(Jan 03)
Bertom McCartney Lake, WI	9	(Jun 92)	Polander Lake, MN	57	(Nov 00)
Big Timber, IA	10	(Jun 95)	Pool 11 Islands, WI/IA	58	(Sept 07)
Blackhawk Park, WI	11	(Nov 90)	Pool 25 and 26 Islands, MO	61	(Sept 17)
Brown's Lake, IA	13	(Sep 94)	Pool 8 Isl, Phase I, WI	62	(Jun 93)
Bussey Lake, IA	14	(Jun 96)	Pool 8 Isl, Phase II, WI	63	(Sep 99)
Calhoun Point, IL	15	(Aug 11)	Pool 8 Isl, Phase III, WI	64	(Jul 12)
Capoli Slough, WI	16	(Sep 17)	Pool 9 Island, WI	65	(Jun 95)
Chautauqua Refuge, IL	17	(Dec 03)	Pool Slough, IA	66	(Apr 07)
Clarksville Refuge, MO	19	(Apr 90)	Potters Marsh, IL	67	(Jul 96)
Cold Springs, WI	21	(Aug 94)	Princeton, IA	68	(Dec 01)
Cottonwood Island, MO	23	(Dec 99)	Rice Lake, MN	71	(Nov 98)
Cuivre Island, MO	24	(Jul 99)	Small Scale Drawdown, WI	73	(Sep 97)
Dresser Island, MO	26	(Sep 91)	Spring Lake, IL	75	(Sep 01)
East Channel, WI, MN	27	(Jun 97)	Spring Lake Islands, WI	76	(Jul 06)
Finger Lakes, MN	28	(Jul 94)	Spring Lake Peninsula, WI	77	(Nov 94)
Fox Island, MO	29	(Sep 16)	Stag & Keaton Is., MO	78	(Sep 98)
Gardner Div.(Long Island Div), IL	31	(Jan 98)	Stump Lake, IL	80	(Nov 98)
Guttenberg Waterfowl Ponds, IA	34	(Oct 90)	Swan Lake, IL	81	(May 15)
Indian Slough, WI	38	(Jun 94)	Trempealeau NWR, WI	83	(Sep 99)
Island 42, MN	39	(May 87)			
Lake Odessa, IA	41	(Jul 17)			
Lake Onalaska, WI	42	(Jul 90)	Economic Impacts of Recreation Study		(Sep 92)
Lansing Big Lake, IA	44	(Nov 94)	Habitat Needs Assessment		(Sep 00)
Long Lake, WI	46	(May 00)	Traffic Monitoring		(Sep 90)

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI





Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI
May 23, 2017

UMRR Projects	Status	Site #
Ambrough Slough	Complete	1
Andalusia Refuge	Complete	2
Banner Marsh	Complete	4
Batchtown	Complete	6
Bay Island	Complete	7
Beaver Island	Active	8
Bertom McCartney Lakes	Complete	9
Big Timber	Complete	10
Blackhawk Park	Complete	11
Brown's Lake	Complete	13
Bussey Lake	Complete	14
Calhoun Point	Complete	15
Capoli Slough	Complete	16
Chautauqua Refuge	Complete	17
Clarence Cannon	Active	18
Clarksville Refuge	Complete	19
Cold Springs	Complete	21
Conway Lake	Active	22
Cottonwood Island	Complete	23
Crains Island	Active	91
Cuivre Island	Complete	24
Delair Division	Active	25
Dresser Island	Complete	26
East Channel	Complete	27
Finger Lakes	Complete	28
Fox Island	Complete	29
Gardner Division (Long Island Division)	Complete	31
Guttenberg Waterfowl Ponds	Complete	34
Harlow Island	Active	35
Harpers Slough	Active	36
Huron Island	Active	37
Indian Slough	Complete	38
Island 42	Complete	39
Keithsburg Division	Active	40
Lake Odessa	Complete	41
Lake Onalaska	Complete	42
Lake Winneshiek	Active	43
Lansing Big Lake	Complete	44
Long Lake	Complete	46

UMRR Projects	Status	Site #
Long Meadow Lake	Complete	47
Lower Pool 10	Active	48
McGregor Lake	Active	49
Mississippi River Bank Stabilization	Complete	3
Monkey Chute	Complete	50
Oakwood Bottoms	Active	92
Peoria Lake	Complete	52
Peterson Lake	Complete	53
Pharrs Island	Complete	54
Piasa - Eagle's Nest Islands	Active	55
Pleasant Creek	Complete	56
Polander Lake	Complete	57
Pool 11 Islands	Complete	58
Pool 12 Overwintering	Active	59
Pool 25 and 26 Islands	Complete	61
Pool 8 Islands Phase I	Complete	62
Pool 8 Islands Phase II	Complete	63
Pool 8 Islands Phase III	Complete	64
Pool 9 Islands	Complete	65
Pool Slough	Complete	66
Potters Marsh	Complete	67
Princeton Refuge	Complete	68
Rice Lake, IL	Active	70
Rice Lake, MN	Complete	71
Rip Rap Landing	Active	72
Small Scale Drawdown	Complete	73
Spring Lake Islands	Complete	76
Spring Lake Peninsula	Complete	77
Spring Lake, IL	Complete	75
Stag and Keaton Islands	Complete	78
Steamboat Island	Active	79
Stump Lake	Complete	80
Swan Lake	Complete	81
Ted Shanks	Active	82
Trempealeau	Complete	83
Turkey River Bottoms Delta and Backwater Complex	Active	84
Weaver Bottoms	Active	85
Produced June 8, 2016		

Division: Mississippi Valley

District: Rock Island

Upper Mississippi River Restoration,
IL, IA, MN, MO, and WI

May 23, 2017

APPROPRIATION TITLE: Construction - Environment, Fiscal Year 2018

PROJECT: Missouri River Fish and Wildlife Recovery, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Tributaries (Continuing)

LOCATION: The Missouri River Main Stem and its tributaries.

DESCRIPTION: The Missouri River Fish and Wildlife Recovery Program includes activities that will enable Missouri River projects to meet authorized purposes and avoid jeopardizing the continued existence of three species listed under the Endangered Species Act (ESA): the Least Tern, Piping Plover and Pallid Sturgeon, as well as activities to mitigate for fish and wildlife habitat losses specifically resulting from the construction and operation of the Missouri River Bank Stabilization and Navigation Project (BSNP). Only funding of activities to avoid jeopardy per the 2003 Biological Opinion (BiOp) is being requested. The total cost of this program is funded at 100 percent Federal expense.

Actions with these funds include: shallow water habitat construction/development for the Pallid Sturgeon; emergent sandbar habitat sustainability for Nesting Tern and Plover; Pallid Sturgeon propagation support; population assessments for the three species; an integrated science monitoring and evaluation program to assess success of management actions for the species; and the development/implementation of an adaptive management strategy (Missouri River Recovery Management Plan), that includes US Fish and Wildlife Service (USFWS) and stakeholder participation in the Missouri River Recovery Implementation Committee (MRRIC), which will address cumulative effects of past actions and planned BiOp actions on the Missouri River.

AUTHORIZATION: All existing authorized Corps of Engineers projects along the Missouri River and tributaries - including the Water Resources Development Acts (WRDA) of 1986, 1988, 1999, & 2007; National Industrial Recovery Act of 1933; Flood Control Acts of 1938, 1944, 1954; River and Harbor Act of 1945; as amended.

REMAINING BENEFIT - REMAINING COST RATIO: The remaining benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

TOTAL BENEFIT-COST RATIO: The total benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

INITIAL BENEFIT-COST RATIO: The benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: The benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

Division: Northwestern

District: Omaha/Kansas City

Missouri River Fish and Wildlife Recovery,
IA, KS, MO, MT, NE, ND, SD, and Tributaries

SUMMARIZED FINANCIAL DATA:		ACCUM PCT OF EST FED COST	Status (1 Jan 2017) Entire Project	PERCENT COMPLETE 21%	PHYSICAL COMPLETION SCHEDULE TBD
Estimated Federal Cost	3,739,687,000				
Estimated Non-Federal Other Costs	0				
Total Estimated Project Cost	3,739,687,000				
Allocations to 30 September 2014	706,442,000				
Allocation for FY 2015	48,771,000				
Allocation for FY 2016	34,627,000				
Allocation for FY 2017	31,090,000				
Allocations through FY 2017	820,930,000	1/2/3/5/	22%		
Estimated Unobligated Carry-In Funds	0	4/			
President's Budget for FY 2018	30,000,000		23%		
Programmed Balance to Complete after FY2018	2,888,757,000				

1/ \$3,175,000 reprogrammed to the project.

2/ \$1,071,000 rescinded from the project.

3/ \$350,000 transferred to the Flood Control and Coastal Emergencies account.

4/ Unobligated Carry-in Funding: The actual unobligated balance from FY 2016 into FY 2017 for this project is \$3,427,000, including \$1,588,000 committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$700,000 are included in this amount.

JUSTIFICATION: Funds for the Missouri River Recovery Program allow the Corps to avoid jeopardizing listed species and comply with the BiOp for operating the Missouri River projects for the eight authorized purposes. Only funding of activities to avoid jeopardy is being requested.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be used as follows:

Item	Amount
Program Management Activities	\$ 5,000,000
Integrated Science Program	16,500,000
Missouri River Recovery Implementation Committee	2,000,000
Shallow Water Habitat	2,000,000
Yellowstone Intake	5,220,000
Real Estate	250,000
Emergent Sandbar Habitat	800,000

Division: Northwestern

District: Omaha/Kansas City

Missouri River Fish and Wildlife Recovery,
IA, KS, MO, MT, NE, ND, SD, and Tributaries

Litigation Support	<u>1,159,000</u>	
Total	\$32,929,000	4/

FISCAL YEAR 2018: The budgeted amount will be used as follows:

Program Management Activities	\$5,000,000
Integrated Science Program	6,520,000
Missouri River Recovery Implementation Committee	2,000,000
Shallow Water Habitat	5,800,000
Yellowstone Intake	5,280,000
Real Estate	1,350,000
Emergent Sandbar Habitat	3,550,000
Litigation Support	<u>500,000</u>
Total	<u>\$30,000,000</u>

NON-FEDERAL COSTS: Not applicable

STATUS OF LOCAL COOPERATION: The 1986 and 1999 authorizing acts for the mitigation below Sioux City provides that the entire cost of the project, including all lands, easements, rights-of-way, relocations, and all operation and maintenance costs, be borne by the Federal Government, with no costs to either local or state governments. Therefore, there is not a non-Federal sponsor for the project.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal estimate of \$3,739,687,000 is the same as last presented to Congress (FY 2017).

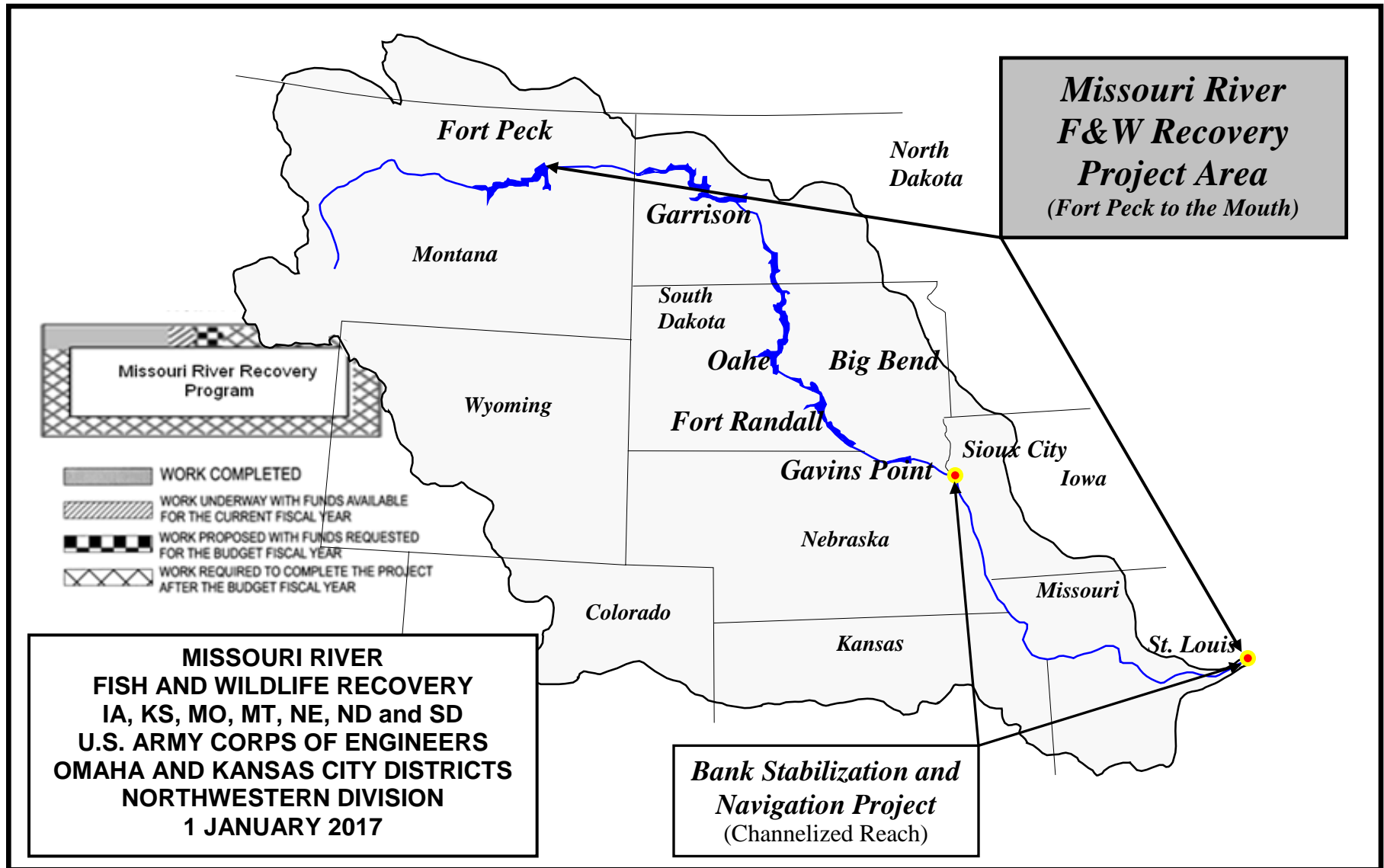
STATUS OF ENVIRONMENTAL IMPACT STATEMENT: The Missouri River Recovery Program is the umbrella program that integrates Corps' activities for compliance with the 2003 Amended Biological Opinion, the BSNP Fish and Wildlife Mitigation Project described in the 2003 Record of Decision, and implementation of WRDA 2007 including the Missouri River Recovery Implementation Committee (MRRIC). A Draft Missouri River Recovery Management Plan EIS (MRRMP-EIS) was developed with the MRRIC and programmatically evaluates the effects of these components on the human environment. This Draft MRRMP-EIS identified a preferred alternative, was released for public review in December 2016, and the public review period ended on April 24, 2017. A final MRRMP-EIS is being prepared and coordinated with the MRRIC. A Final EIS was completed for the Lower Yellowstone Intake Diversion Dam Fish Passage Project in October 2016 and a Record of Decision was signed in December 2016.

OTHER INFORMATION: Funds to initiate pre-construction engineering and design of the BSNP mitigation project were appropriated in FY 1990. Initial construction funds for the BSNP mitigation project were appropriated in FY 1992. Funding for the combined ESA and mitigation efforts, now known as Missouri River Fish and Wildlife Recovery, were first appropriated in FY 2005.

Division: Northwestern

District: Omaha/Kansas City

Missouri River Fish and Wildlife Recovery,
IA, KS, MO, MT, NE, ND, SD, and Tributaries



APPROPRIATION TITLE: Construction – Dam Safety Seepage Correction, Major Rehabilitation, Fiscal Year 2018

PROJECT: Rough River Lake, KY Major Rehabilitation (Continuing)

LOCATION: The dam site is located on Rough River, 89.3 miles east of the confluence with the Green River, and about 60 air miles southwest of Louisville, KY.

DESCRIPTION: The Rough River Dam is part of a system of dams that reduce the risk of flood damage in the Green River Basin of Kentucky. Construction began in 1955 and the dam began full operation in 1960. The project is a 1,590 foot long earth filled embankment with a maximum height of 130 feet. It includes a gate-controlled outlet works on the right abutment and a 65-foot wide uncontrolled spillway near the left abutment.

The Dam Safety Modification Report was approved on 7 March 7, 2013 and the approval to proceed with the design and construction of the Phase 2 cutoff wall was provided on February 10, 2017.

Per the Dam Safety Modification Report, the project consists of two phases. Phase 1 consists of relocating KY State Highway 79 from the crest of the dam to the upstream slope to allow for exploratory drilling and grouting of the rock foundation. This phase was completed in May 2017. Phase 2 consists of constructing a deep concrete cutoff wall through the embankment and into the rock foundation. The cost of this project is funded at 100 percent Federal expense. All work is programmed.

AUTHORIZATION: Flood Control Act (Public Law 761, 75th Congress, 28 June 1938)

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable because this is a dam safety project.

TOTAL BENEFIT-COST RATIO: Not applicable because this is a dam safety project.

INITIAL BENEFIT-COST RATIO: Not applicable because this is a dam safety project.

BASIS OF BENEFIT-COST RATIO: Not applicable because this is a dam safety project.

SUMMARIZED FINANCIAL DATA

		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017) Entire Project	PERCENT COMPLETE 7	PHYSICAL COMPLETION SCHEDULE TBD
Original Project					
Actual Federal Cost	\$10,620,000				
Actual Non-Federal Cost	\$23,000				
Total Original Project Cost	\$10,643,000				
Project Modification					
Estimated Federal Cost	\$149,000,000				
Authorized Cost (plus inflation)	\$144,936,000				
Admin Maximum Cost Limit (Section 902)	\$172,367,000	6/			
Allocations to 30 September 2014	\$9,414,000				
Allocation for FY 2015	\$25,000,000				
Allocation for FY 2016	\$0				
Allocation for FY 2017	\$1,249,999		6%		
Allocations through FY 2017	\$35,663,999	1/2/3/5/			
Estimated Unobligated Carry-in Funds	\$0	4/			
President's Budget for FY 2018	\$25,000,000		23%		
Programmed Balance to Complete after FY 2018	\$88,336,001				
Unprogrammed Balance to Complete after FY 2018	\$0				

1/ \$372,999 reprogrammed to the project, including \$49,999 that was reprogrammed in FY 2017.

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$2,173,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$1,872,999 are included in this amount.

6/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

Division: Great Lakes and Ohio River

District: Louisville

Rough River Lake, KY (Dam Safety)

PHYSICAL DATA:

Dam: Earth core with rock fill, 1,590 ft in length.

Spillway: In a natural saddle, approx 900 ft southwest of the left abutment of the embankment, 65 ft wide, with design discharge capacity of 22,000 cfs.

Outlet Works: Intake structure with 3 slide gates, two 24 inch low flow bypass pipes, 12' x 12' semi-elliptical concrete conduit, and discharge bucket.

JUSTIFICATION: Rough River Dam is a Dam Safety Action Classification (DSAC) 2, which is defined by ER 1110-2-1156 as "High Urgency" where failure could begin during normal operations or be initiated by an event; or the incremental risk – combination of life or economic consequences with likelihood of failure – is high. The risk assessment cited the potential for seepage and piping failure modes and recommended action to remedy these potential risks.

FISCAL YEAR 2017: The appropriated funds, plus carry-in funds, are being applied as follows:

Complete design of cutoff wall and complete P&S For Construction contract	\$ 1,250,000
Engineering During Construction, Project Management, Construction Management	\$ 2,173,000
Total	\$ 3,423,000

FISCAL YEAR 2018: The budgeted amount plus carry-in funds will be applied as follows:

Continue Construction – Initiate Cutoff Wall Contract	\$ 22,000,000
Engineering During Construction, Project Management, Construction Management	\$ 3,000,000
Total	\$ 25,000,000

STATUS OF LOCAL COOPERATION: None required.

COMPARISON OF FEDERAL COST ESTIMATE: The current Federal cost estimate of \$149,000,000 is the same as the latest estimate presented to Congress (FY 2017). The project is in the process of obtaining a certified cost estimate this fiscal year.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The Environmental Assessment was prepared in conjunction with the Dam Safety Modification Report and a Finding of No Significant Impact (FONSI) was signed by the District Commander in July 2012.

OTHER INFORMATION: The dam safety evaluation for this project first received funds under the Dam Safety and Seepage/Stability Correction Program line item in FY 2008.

APPROPRIATION TITLE: Construction, General – Aquatic Ecosystem Restoration, Fiscal Year 2018

PROJECT: Poplar Island, Maryland (Continuing)

LOCATION: Poplar Island is a group of islands located in the upper middle Chesapeake Bay approximately 34 nautical miles southeast of the Port of Baltimore and 1 mile northwest of Tilghman Island, Talbot County, MD.

DESCRIPTION: The environmental restoration project based on the Chief's report dated 3 September 1996 consists of reconstructing Poplar Island to its approximate size in 1847—1,140 acres using an estimated 40 million cubic yards of uncontaminated dredged material from maintenance dredging of the approach channels of the Baltimore Harbor and Channels Navigation project. This restoration will be accomplished through the construction of approximately 35,000 feet of armored dikes, which will contain the dredged material needed to form tidal marsh wetlands and upland habitat and to protect the dredged material placement area from severe wave activity.

Section 3087 of WRDA 2007 authorized a 575-acre expansion of Poplar Island based on the Chief's report dated 31 March 2006. The expansion will include wetlands, uplands and open water. The expansion will include a 5-foot raising of the existing uplands dikes on Poplar Island and will increase the island's overall dredged material placement capacity by 28 million cubic yards.

AUTHORIZATION: Section 537 of P.L. 104-303 (WRDA 1996), as amended by: Section 318 of P.L. 106-541 (WRDA 2000); Section 3087 of P.L. 110-114 (WRDA 2007) and Sections 7003 and 1030 (d) (2) of P.L. 113-121 (WRRDA 2014).

REMAINING BENEFIT-REMAINING COST RATIO: The remaining benefit –cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

TOTAL BENEFIT-COST RATIO: The total benefit –cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

INITIAL BENEFIT-COST RATIO: The initial benefit –cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: The benefit –cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost		1,078,895,000	Entire Project	28	TBD
Programmed Construction	1,078,775,000				
Un-programmed Construction	120,000				
Estimated Non-Federal Cost		359,239,000			
Programmed Construction	359,119,000				
Cash Contributions	83,819,000				
Other Costs	275,300,000				
Estimated Non-Federal Cost					
Unprogrammed Construction	120,000				
Cash Contributions	120,000				
Other Costs	0				
Total Estimated Programmed Construction Cost		1,437,894,000			
Total Estimated Unprogrammed Construction Cost		240,000			
Total Estimated Project Cost		1,438,134,000			
Authorized Cost (plus inflation)		1,438,134,000			
Maximum Cost Limit (Section 902)		1,650,896,000			
Allocations to 30 September 2014	242,377,000				
Allocation for FY 2015	15,100,000				
Allocation for FY 2016	47,300,000				
Allocation for FY 2017	62,650,000				
Allocations through FY 2017	367,427,000	1/ 2/ 3/ 5/	34		
Estimated Unobligated Carry-in Funds	0	4/			
President's Budget for FY 2018	36,250,000		37		
Programmed Balance to Complete after FY 2018	675,098,000	6/			
Un-programmed balance to Complete after FY 2018	120,000				
1/ \$6,310,015 reprogrammed to the project.					
2/ \$417,244 rescinded from the project.					
3/ \$0 transferred to the Flood Control and Coastal Emergencies (FCCE) account.					
4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$3,709,000, including \$2,126,000 of unobligated funds that are committed within in the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this effort is \$0.					
5/ PED costs of \$0 are included in this amount; there were no PED costs for the project.					

Division: North Atlantic

District: Baltimore

Poplar Island, MD

6/ For programmed work only; remaining work is un-programmed pending a decision to construct these features.

PHYSICAL DATA: The Poplar Island environmental restoration project consists of earth and rock containment dikes and appurtenant structures. The completed project will create wetlands, uplands, and open-water habitat.

JUSTIFICATION: Poplar Island was eroding at more than 13 feet per year before this restoration began and would have disappeared without this effort. The plan to restore the island using uncontaminated dredged material from maintenance dredging of the Baltimore Harbor and Channels navigation project was developed through the cooperative efforts of many state and Federal agencies, as well as private organizations.

FISCAL YEAR 2017: The appropriated funds, plus carry-in funds, are being applied as follows:

<u>Original Work</u>	
Construction management, monitoring, and stakeholder coordination.	\$ 3,400,000
Inflow of dredged material for wetlands and island cell development	0 7/
Cell 5A-B wetland planting	850,000
<u>Expansion Work</u>	
Initiate construction of lateral expansion embayment and wetland containment dikes	62,109,000 8/
Total	\$ 66,359,000

7/ This work is no longer needed since inflow from Baltimore Harbor and Channels 50-foot project, which attribute to Poplar Island, will not occur in FY 2017.

8/ This work increased from \$46,750,000 to \$59,983,000 due to the increase in the unit price for rock, which will be used to construct the containment dikes.

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

<u>Original Work</u>	
Construction management, monitoring, and stakeholder coordination.	\$ 3,400,000
Inflow of dredged material for wetlands and island cell development	11,300,000
<u>Expansion Work</u>	
Continue construction of lateral expansion.	21,550,000
Total	\$ 36,250,000

NON-FEDERAL COST: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the non-Federal sponsor must comply with the requirements listed below:

	Payments During Construction and	Annual Operation Maintenance and Replacement
Division: North Atlantic		
District: Baltimore		
		Poplar Island, MD

Requirements of Local Cooperation	Reimbursements	Costs
Provide lands, easements, and rights-of-way	\$ 39,000	
Pay one-half of the separable costs allocated to recreation and bear all costs of operation, maintenance, repair, rehabilitation and replacement of recreation features.	120,000	0
Pay 25 percent of the cost allocated to fish & wildlife restoration (including \$275,300,000 in credits for in-kind services and materials) and bear all costs of operation, maintenance, repair, rehabilitation and replacement of fish and wildlife facilities.	359,080,000	750,000
Total Non-Federal Costs	\$359,239,000	750,000

STATUS OF LOCAL COOPERATION: The State of Maryland is the non-Federal sponsor. By letter dated 16 May 1996, the State of Maryland stated its intent to be the non-Federal sponsor and participate in project cost sharing in accordance with the Water Resources Development Act of 1986. The Project Cooperation Agreement was executed in April 1997, amended 9 April 2002 to reflect in-kind services authorized by the Water Resources Development Act of 2000, amended December 2012 to reflect C&D approach channel beneficial use material, and amended May 2016 to include construction of the project's authorized expansion. A separate design agreement was executed in October 2012 to reflect the expansion authorized by the Water Resources Development Act of 2007. To date, the State has fully complied with the local requirements on the project.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$1,078,895,000 is an increase from the last estimate (\$1,066,141,000) presented to Congress (FY 2017). This change includes the following items.

Item	Amount
Price Escalation on Construction Features	\$12,754,000
Total	\$12,754,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The EIS was distributed for review and was finalized in February 1996 under the authority of Section 204 of the Water Resources Development Act of 1992.

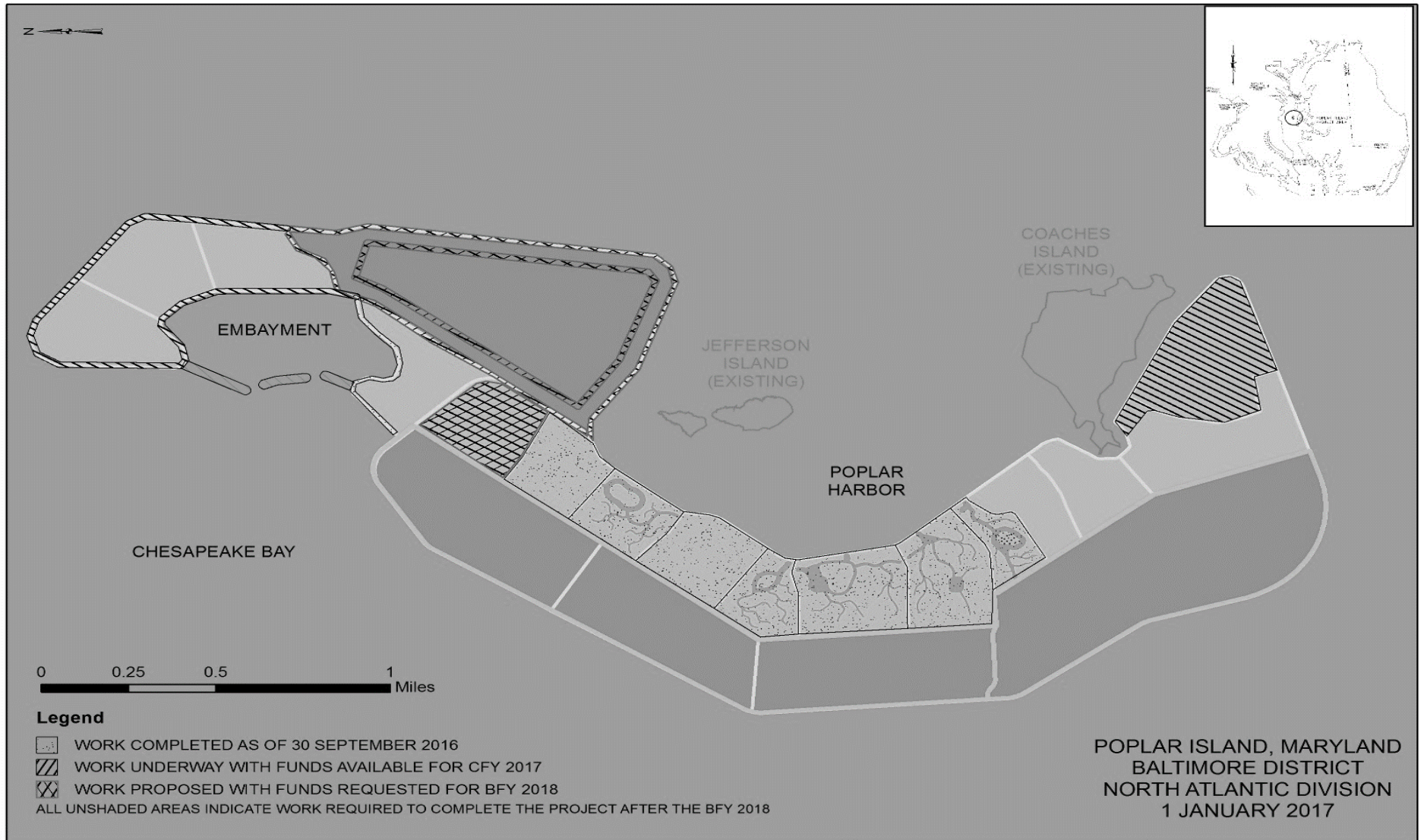
OTHER INFORMATION: Funds to initiate construction of the original project were appropriated in FY 1994. Planning for this project was accomplished under the authority of Section 204 of the Water Resources Development Act (WRDA) of 1992. Section 3087 of WRDA 2007 authorized expansion construction in accordance with the cost sharing provisions of section 204 WRDA 1992 (75-25). Section 2037 of WRDA 2007 amended Section 204 to provide that the additional work would be cost shared in accordance with Section 103(d)(7) of WRDA 1986 which provides for 65-35 cost sharing as opposed to the 75-25 cost sharing previously authorized. A Limited Reevaluation Report presenting the new increased cost estimate, was completed using project funds in the amount of \$110,000 and submitted for reauthorization to the Speaker of the House and the President of the Senate on February 26, 2014. As part of the continuing wetlands development design process it was determined to be more effective and efficient to increase the size of cells 3a and 3c thereby eliminating the need and additional costs for cell 3b while maintaining the tidal wetlands development and delivery schedule. Design for the Expansion work commenced in FY 2013. On 26 February

Division: North Atlantic

District: Baltimore

Poplar Island, MD

2014 OMB transmitted the Directors report (dated 22 July 2013) to Congress recommending a total project cost estimate in the amount of \$1,233,754,000 (1 Oct 2012 price level) with its fully funded estimate in the amount of \$1,430,207,000. WRRDA 2014 Sections: 7003 authorized the project cost modification; and, 1030(d)(2) reinstated the original WRDA 1996 cost sharing requirement of 75 percent Federal and 25 percent non-Federal. On 21 September 2015, the ASA(CW) completed the integral determination of eligibility for estimated in-kind contributions in the amount of \$272,252,000 from the non-Federal sponsor as part of their share of the total estimated project cost. Funds to initiate construction of the expansion project were appropriated in FY 2016.



APPROPRIATION TITLE: Construction – Navigation, Fiscal Year 2018

PROJECT: Boston Harbor Navigation Improvement Project, Massachusetts

LOCATION: Boston Harbor is located along the eastern shoreline of Massachusetts about 240 miles northeast of New York City.

DESCRIPTION: Boston Harbor is New England’s largest port serving as the principal distribution point for the export and import of commerce for Massachusetts, New Hampshire and Vermont. Boston Harbor consists of entrance channels extending about three miles from Massachusetts Bay to President Roads, the main ship channel connecting the Roads to the inner harbor, anchorage areas in the Roads and lower inner harbor, and three principal deep-draft industrial tributaries in the Reserved Channel, Mystic River and Chelsea River. The project will deepen the Broad Sound North Entrance Channel to 51 feet; the President’s Roads, the outer Main Ship and the Lower Reserved Channels to 47 feet; the Main Ship Channel between the Reserved Channel and Massport Marine terminal to 45 feet; and the Chelsea River and a small portion of the Mystic River Channels to 40 feet. All work is programmed except deepening of the Main Ship Channel between the Reserved Channel and Massport Marine terminal to 45 feet and deepening the Mystic River Channel to 40 feet, which require confirmation of terminal usage, and deepening the Chelsea River, which requires local commitments to berth dredging. The total estimated project cost is \$306,200,000. All budgeted work is supported by the September 2013 Chief’s Report for Boston Harbor Navigation Improvement Project, Massachusetts.

AUTHORIZATION: Section 7002 of the Water Resources Reform and Development Act of 2014, PL 113-121.

REMAINING BENEFIT-REMAINING COST RATIO: The remaining benefit–cost ratio for the entire project is 4.5 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: The total benefit–cost ratio for the entire project is 4.4 to 1 at 7 percent.

BASIS OF BENEFIT-COST RATIO: Benefit-cost ratios are based on the latest economic analysis contained in the Chief’s Report for Boston Harbor Navigation Improvement Project, Massachusetts, dated 30 September 2013, and expressed at October 2012 price levels.

Division: North Atlantic	ACCUM PCT OF EST	STATUS	PCT	PHYSICAL COMPLETION
	District: New England			Boston Harbor, MA

SUMMARIZED FINANCIAL DATA:

		FED COST	(May 2017)	CMPL	SCHEDULE
Estimated Total Appropriation Requirement	229,600,000		Dredging	0	Dec 2020
			Rock Removal	0	Sep 2022
			Entire Project	0	Sep 2022
Estimated Federal Costs (Ultimate)	229,600,000				
Estimated Non-Federal Costs	76,600,000				
Cash Contributions	76,400,000				
Other Costs	200,000				
Total Estimated Project Cost	306,200,000				
Authorized Cost (plus inflation)	320,792,000				
Maximum Cost Limit (Section 902)	382,988,000				
Allocations to 30 September 2014	1,240,000				
Allocation for FY 2015	1,800,000				
Allocation for FY 2016	1,284,200				
Allocation for FY 2017	18,225,000				
Allocations through FY 2017	22,549,200	1/ 2/ 3/ 5/	10		
Estimated Unobligated Carry-in Funds	0	4/			
President's Budget for FY 2018	58,000,000		35		
Programmed Balance to Complete after FY 2018	121,050,800	6/			
Un-programmed Balance to Complete after FY 2018	28,000,000				

1/ \$0 reprogrammed from the project.

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Unobligated Carry-in Funding: This project was a new start in FY 2017. As of the date the budget was finalized, the total unobligated dollars estimated to be carried-into FY 2018 from prior appropriations for use on this effort is \$0. There is uncertainty with regard to ability to award the continuing contract in FY 2017, but if it is delayed – it will be awarded very early in FY 2018.

5/ PED costs of \$4,324,200 are included in this amount.

6/ For programmed work only; remaining work is un-programmed pending a decision to construct these features.

PHYSICAL DATA: The improvement project requires the removal of about 11 million cubic yards of dredged material and 1 million cubic yards of rock. The recommended plan involves placement of all the dredged material and rock at the Massachusetts Bay Disposal Site. However, it is the policy of the U.S. Army Corps of Engineers to use dredged material, where practicable, for beneficial use. Uses of the rock for offshore reef creation and shore protection will be investigated in partnership with the state during project design. Use of the dredged material to cap the former Industrial Waste Site in Massachusetts Bay will also be investigated in partnership with the U.S. Environmental Protection Agency and others during project design. None of these potential beneficial uses are expected to increase project costs and will be done within budgeted authorized amount.

Division: North Atlantic

District: New England

Boston Harbor, MA

JUSTIFICATION: The improvement project will result in transportation cost savings by allowing cargo to shift from overland transport to ship transport and allowing the larger Post-Panamax vessels to operate more efficiently and experience fewer tidal and transit delays. Ships drawing 45-foot drafts now make 3 calls a week to Boston Harbor. In 2013, waterborne commerce totaled 17.1 million tons, of which approximately 80 percent were liquid petroleum products. The average annual benefits amount to \$103,496,000 all for commercial navigation.

FISCAL YEAR 2017: The appropriated funds are being applied as follows:

Execute Project Partnership Agreement	\$ 100,000
Award continuing contact to initiate dredging	\$18,125,000
Total	\$ 18,225,000

FISCAL YEAR 2018: The budgeted amount, will be applied as follows:

Continue Dredging	\$ 56,175,000
Construction Management	\$ 1,200,000
Planning, Engineering, and Design	\$ 625,000
Total	\$ 58,000,000

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, as amended, the non-Federal sponsor must comply with the requirements listed below.

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair, Rehabilitation and Replacement cost
Provide lands, easements, rights of way, and perform all relocations determined by the Federal Government to be necessary for the construction, operation and maintenance of the project.	\$ 200,000	\$ 0
Pay 25 percent of the costs allocated to general navigation features with a depth in excess of 20 feet but not in excess of 50 feet during construction.	\$ 76,400,000	\$ 0
Reimburse an additional 10 percent of the costs of general navigation features allocated to commercial navigation within a period of 30 years following completion of construction, as reduced by a credit allowed for the value of lands, easements, rights of way, and relocations provided for commercial navigation.	\$ 30,620,000	\$ 0
Total Non-Federal Costs	\$ 107,220,000	\$ 0

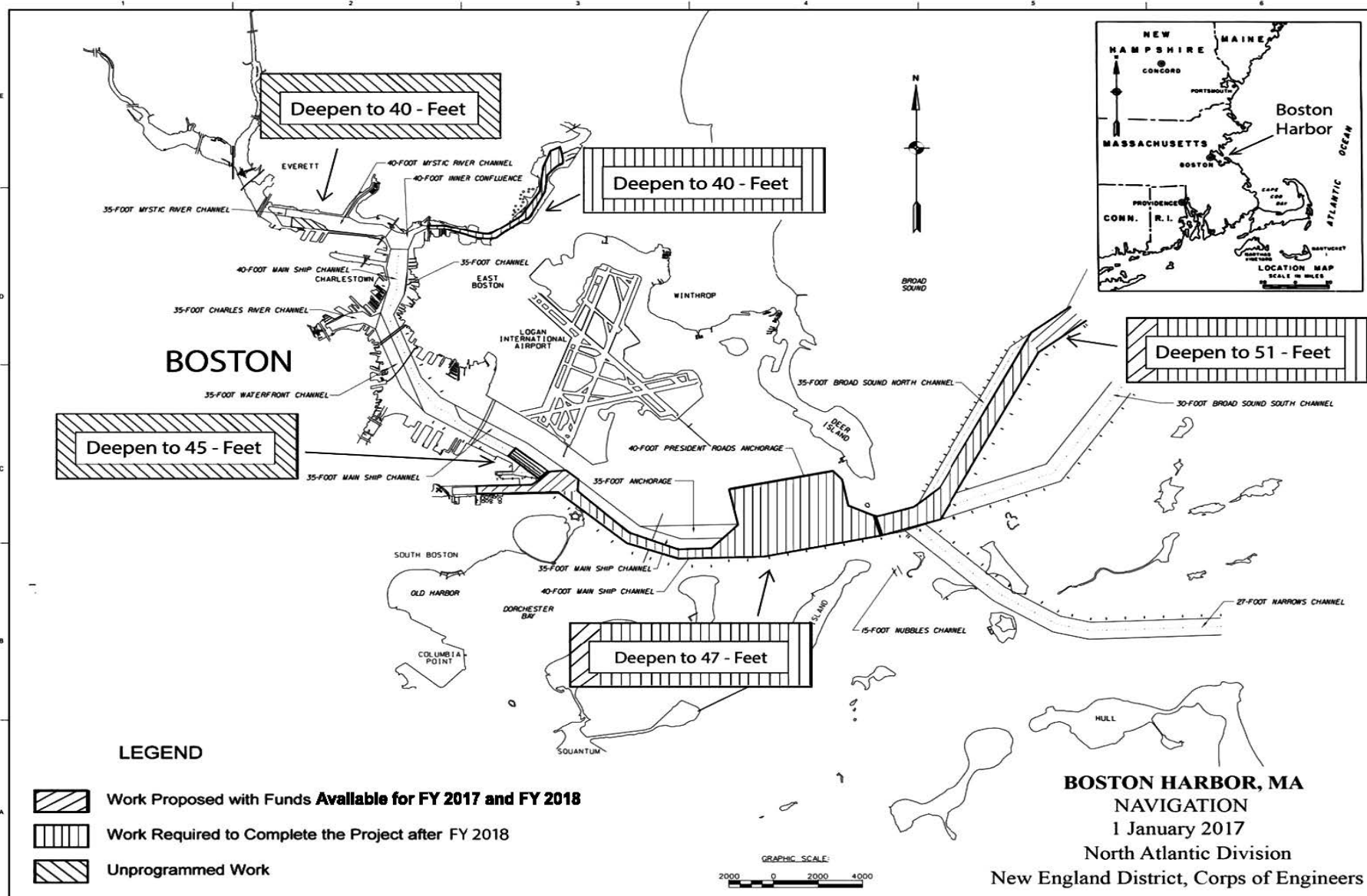
The non-Federal sponsor has also agreed to make all required payments concurrently with project construction and reimburse its share of construction costs allocated to general navigation features within a period of 30 years following completion of construction.

STATUS OF LOCAL COOPERATION: The sponsor for the project is the Massachusetts Port Authority (Massport) who administers harbor operations. Massport signed an agreement for design of the project on 19 May 2014. Massport understands the requirements of local cooperation and is prepared to enter into a Project Partnership Agreement with the Corps no later than 30 September 2017. Massport will obtain all state and local permits, as well as acquire all lands, easements and rights-of-way necessary for project construction.

COMPARISON OF FEDERAL COST ESTIMATES: This is the first Budget justification sheet provided to Congress for this project.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: The Supplemental Environmental Impact Statement and Record of Decision were signed on 3 November 2014.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY2010. The first effort would involve dredging all ordinary material to authorized depth and/or top of rock for deepening of the main ship channel into Conley Terminal. The removal of ordinary material is projected to cost \$209.1 million and will be accomplished using a continuing contract. The out year funding includes two fully funded contracts, one for rock removal to authorized depth and a third fully funded contract to deepen the Chelsea River channel, a segment in the Mystic channel, and a small segment of the Main Shipping Channel to the Massport Marine Terminal.



APPROPRIATION TITLE: Construction, General - Flood and Coastal Storm Damage Risk Reduction, Fiscal Year 2018

PROJECT: Raritan River Basin, Green Brook Sub-Basin, New Jersey (Continuing)

LOCATION: The Green Brook Sub-Basin project area is located within the Raritan River Basin in north-central New Jersey in Middlesex, Somerset and Union Counties. It drains approximately 65 square miles of primarily urban and industrialized area. It includes the following communities: Dunellen, Middlesex Borough, Piscataway, South Plainfield, Bound Brook, Bridgewater, Green Brook, North Plainfield, Warren, Watchung, Berkeley Heights, Plainfield and Scotch Plains. The project area is divided into three sub-areas: the lower, upper and Stony Brook portions of the sub-basin.

DESCRIPTION: The project plan was documented in a May 1997 General Reevaluation Report and consists of a system of levees, floodwalls, closure gates and pump stations in the lower portion of the basin, channel modifications and dry detention basins in the upper portion of the basin, and channel modifications in the Stony Brook portion of the basin.

Elements 1a consists of levee segments U, R & T in the Bound Brook (Somerset County) portion of the lower basin.

Element 1b consists of Segments C, H, B & D in the Boro of Middlesex portion of the lower basin.

Element 1c consists of Segments E, F, G, P, Q, I, J & K in the remaining lower basin portion of the project.

Element 2 consists of Segment O (Oakway) dry detention basin, Segment S (Skytop) dry detention basin and Segment M all in the upper basin area of the project.

Element 3 consists of Segment L, the Stony Brook portion of the basin.

The New Jersey Department of Environmental Protection is the non-Federal sponsor. The cost of this project is shared 75 percent Federal and 25 percent non-Federal.

AUTHORIZATION: Water Development Act of 1986.

REMAINING BENEFITS-REMAINING COST RATIO: 2.0 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: 1.3 to 1 at 7 percent.

INITIAL BENEFIT-COST RATIO: 1.4 to 1 at 7 percent (FY 1998).

BASIS OF BENEFIT-COST RATIO: Benefits are from the analysis contained in the Final General Reevaluation Report (dated May 1997) at April 1996 price levels and the Level 1 Economics Update Report (dated 9 June 2011) as updated in July 2012 for budget purposes.

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2016)	PCT Cmpl	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost		492,037,000				
Programmed Construction	417,037,000			Element 1a	100	2015
Unprogrammed Construction	75,000,000			Element 1b	7	TBD
				Element 1c	0	TBD
				Element 2	0	TBD
Estimated Non-Federal Cost		164,012,000		Element 3	0	TBD
Programmed Construction	139,012,000			Entire Project	33	TBD
Cash Contributions	89,012,000			PHYSICAL DATA		
Other Costs	50,000,000			Element 1a is Bound Brook (Somerset County) portion		
Unprogrammed Construction	25,000,000			lower basin. Element 1b is Boro of Middlesex portion of		
Cash Contributions	10,000,000			lower basin in Middlesex County. Element 1c includes		
Other Costs	15,000,000			all final portions remaining within the lower basin		
Total Estimated Programmed Construction Cost		556,049,000		Element 2 (Unprogrammed) is the upper basin,		
Total Estimated Unprogrammed Construction Cost		100,000,000		includes channel modifications, dry detention basins.		
Total Estimated Project Cost		656,049,000		Element 3 is the Stony Brook Portion of the basin.		
Authorized Cost (plus inflation)		679,034,000				
Maximum Cost Limit (Section 902)		719,634,000				
Allocation through FY 2014		157,077,000				
Allocation for FY 2015		11,000,000				
Allocations for FY 2016		7,500,000				
Allocation for FY 2017		10,000,000				
Allocations through FY 2017		185,577,000	38	1/2/3/5		
Estimated Unobligated Carry-in Funds		12,911,000		4/		
President's Budget Amount for 2018		20,000,000	42			
Programmed Balance to complete after FY 2018		211,460,000				
Unprogrammed Balance to complete after FY 2018				75,000,000		
1/ \$590,300 reprogrammed from the project in prior FYs.						
2/ \$199,000 rescinded from the project.						
3/ \$0 transferred to the Flood Control and Coastal Emergencies account.						
4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 into FY 2017 was \$16,351,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried-into FY 2018 from prior appropriations for use on this effort is \$12,911,000.						
5/ PED costs of \$ 23,998,000 are included in this amount.						

JUSTIFICATION: The project area experiences flood damages periodically. Most recently, flooding during the April 15-17, 2007 Nor'easter and the September 16-18, 1999 Tropical Storm Floyd led to a designation of a Major Disaster Area. Eight deaths have been attributed to floods in the basin. In the recent April 2007 Nor'easter, 34 people were injured and there were more than 1,000 people evacuated from their residences. In Bound Brook, five homes caught fire and burned to the ground the night of April 16th when high water prevented emergency personnel from reaching them. After the flood, FEMA and SBA spent about \$16.5

million on loans and grants for individuals and businesses statewide; another \$3.3 million was provided by FEMA as public assistance to help repair infrastructure and pay for police overtime. National Flood Insurance claims paid in Bound Brook totaled about \$19.8 million. Beyond the Federal dollars, the April flood cost private insurers \$160 million statewide for homeowner, auto, and other claims.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, is being applied as follows:

Construction Management/ Engineering and Design	\$ 2,000,000	
Award Element 1b, Segment B2 Contract 1	\$ 4,440,000	6/
Award Element 1b, Segment B3, Contract 1	\$ 7,000,000	7/
Total	\$13,440,000	4/ 8/ 9/ 10/

6/ This contract was funded in FY 2016, but awarded in FY 2017 due to real estate acquisition issues.

7/ This contract was funded in FY 2016, but awarded in FY 2017 due to bid protest.

8/ Award of Element 1b, Segment H, South Lincoln Ave Bridge, Replacement/Modification Contract 1 (\$8,000,000) was deemed unnecessary due to updated H&H analysis

9/ Award of Element 1b, Segment C1, Contract 1 (\$5,557,000) was delayed until FY 2018 due real estate acquisition issues.

10/ Award of Nonstructural Flood Proofing, Piscataway Township Structures (\$2,000,000) delayed to FY 2018 due to real estate acquisition issues.

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

Award Element 1b, Segment C2 & H, Contract 2	\$15,000,000	
Award Nonstructural Flood Proofing, Piscataway Township Structures	\$ 2,000,000	
Award Nonstructural Flood Proofing, Green Brook Township Structures	\$ 2,000,000	
Award Element 1b, Segment C1, Contract 1	\$ 5,500,000	4/ 6/
Award other contracts for Element 1b	\$3,000,000	
Construction Management/ Engineering and Design	\$5,411,000	
Total	\$32,911,000	

NON-FEDERAL COSTS: In accordance with the cost sharing and financing concepts reflected in the Water Resources Development Act of 1986, the non-Federal sponsor must comply with the requirements listed below:

Requirements of Local Cooperation	Payments During Construction and Reimbursements	Annual Operation, Maintenance, Repair Rehabilitation, and Replacement Costs
Provide lands, easements, rights of way, relocations and borrow excavated or dredged material disposal areas.	\$ 50,000,000	
Pay 25 percent of cost associated with non-structural flood protection	25,000,000	
Pay 6 percent of the costs allocated to flood control, to bring the total non-Federal share of flood control costs to 25 percent, as determined under Section 103 (m) of the Water Resources Development Act of 1986 and bear all costs of operation, maintenance, repair, rehabilitation and replacement of flood control facilities.	89,012,000	\$1,157,000
Total Non-Federal Cost	\$164,012,000	\$1,157,000

The non-Federal sponsor has also agreed to make all required payments concurrently with project construction.

STATUS OF LOCAL COOPERATION: The Project Cooperation Agreement was executed in June 1999 between the Department of the Army and the New Jersey Department of Environmental Protection. Project support continues.

COMPARISON OF FEDERAL COST ESTIMATE: The current Federal cost estimate of \$492,037,000 is the same as the latest estimate (\$492,037,000) presented to Congress (FY 2017).

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: The final Environmental Impact Statement (EIS) was filed in August 1980. A Supplemental Environmental Impact Statement with the Final General Reevaluation Report was released in May 1997 and the Record of Decision was issued in July 1998.

OTHER INFORMATION: Funds to initiate preconstruction engineering and design were appropriated in FY 1988. Funds to initiate construction were appropriated in FY 1998.

APPROPRIATION TITLE: Construction, Navigation (Major Rehabilitation), Fiscal Year 2018

PROJECT: Columbia River at the Mouth, Oregon and Washington (Continuing)

LOCATION: The project is located at the entrance of the Columbia River to the Pacific Ocean and is about 120 miles downstream of Portland, OR and Vancouver, WA.

DESCRIPTION: Per the June 2012 Major Rehabilitation Report, the project will rehabilitate the Mouth of Columbia River (MCR) jetty system which consists of three rubble-mound jetties, with a total originally authorized length of 10.2 miles. The jetty system was constructed from 1885-1939 on massive tidal shoals to secure consistent navigation through the coastal inlet. The North Jetty is about 2.5 miles long, the South Jetty is about 6.6 miles long and the Spur Jetty 'A' is about 1.1 miles long. Rehabilitation will take place first at Jetty A to stabilize the North Jetty root, then at the North Jetty and head stabilization at STA 101, concluding with the South Jetty. This project is funded at 100 percent Federal expense. All work is programmed.

AUTHORIZATION: River & Harbors Acts; 5 July 1884, 3 March 1905 and 3 September 1954. Public Law 98-63, 30 July 1983.

REMAINING BENEFIT - REMAINING COST RATIO: 1.1 to 1 at 7 percent.

TOTAL BENEFIT-COST RATIO: 1.1 to 1 at 7 percent. (This project is justified based on risk to human safety.)

INITIAL BENEFIT - COST RATIO: N/A

BASIS OF BENEFIT COST RATIO: Benefits are based on the June 2012 major rehabilitation report at 2012 price levels.

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
				Jetty 'A'	80%	Sept. 2017
				North Jetty	5%	TBD
				South Jetty	0%	TBD
Estimated Federal Cost		\$281,774,000	<u>1/</u>			
Programmed Construction	281,774,000					
Un-programmed Construction	0					
Estimated Non-Federal Cost		0				
Total Estimated Programmed Construction Cost		281,774,000				
Total Estimated Unprogrammed Construction Cost		0				
Total Estimated Project Cost		281,774,000				
Allocations to 30 September 2014		1,000,000				
Allocation for FY 2015		3,600,000				
Allocation for FY 2016		20,000,000				
Allocation for FY 2017		21,900,000				
Allocations through FY 2017		46,500,000	2/ 3/ 4/ 6/	17%		
Estimated Unobligated Carry-in Funds		0	5/			
President's Budget for FY 2018		22,000,000		24%		
Programmed Balance to Complete after FY 2018		213,274,000				
Un-programmed Balance to Complete after FY 2016		0				

1/ The mitigation requirements for this project are currently unknown.

2/ \$ 0 reprogrammed to the project.

3/ \$ 0 rescinded from the project.

4/ \$ 0 transferred to the Flood Control Emergencies account.

5/ Unobligated Carry-in Funding: The actual unobligated balance from FY 2016 into FY 2017 for this project is \$1,456,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$ 0.

6/ PED costs of \$0 are included in this amount.

PHYSICAL DATA: The Rivers and Harbor Act of 5 July 1884 authorized construction of the South Jetty (first 4.5 miles) to attain a 30-foot deep navigation channel across the MCR bar. The Rivers and Harbor Act of 3 March 1905 authorized the extension of the South Jetty to 6.6 miles and construction of the North Jetty to 2.5

Division: Northwestern

District: Portland

Columbia River at the Mouth, OR & WA

miles long to attain a 40-foot channel. Jetty A was authorized and constructed to 1.1 miles in length for channel stabilization in connection with the rehabilitation of the North Jetty. Its purpose was to assist in controlling the location and direction of the ebb tidal flow through the navigation entrance.

JUSTIFICATION: Continued deterioration, ongoing storm activity, and the continued loss of sand shoal material at the foundation of each of the three MCR jetties, has resulted in more frequent and costly emergency repairs. In the absence of action to address this concern, the jetties and sand shoals upon which they rest will further deteriorate, increasing the likelihood of a jetty breach, which could have a significant impact on access to the entrance of the navigation channel by commercial deep draft vessels using Columbia River port facilities

Rehabilitation of all three jetties would also: (1) lessen wave heights and currents affecting the navigation channel thus improving safety; (2) decrease future O&M dredging; (3) decrease the need for O&M repairs; and (4) improve structural reliability of the jetties. The MCR jetty system is the most significant coastal navigation structure in the Pacific Northwest.

Functioning jetties at the MCR annually support the following: 7/

- 44 million tons of cargo
- 4,382 vessel crossings

7/ Data from Waterborne Commerce of the United States, 2015

The Average Annual Benefits are: \$16,561,499

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be applied as follows:

Continue Planning Engineering and Design	\$1,456,000
Procure Rock for North Jetty	21,900,000
Total	\$23,356,000

FISCAL YEAR 2018: The budget amount plus carry-in funds will be applied as follows:

Procure Rock and Initiate Placement at North Jetty	\$22,000,000
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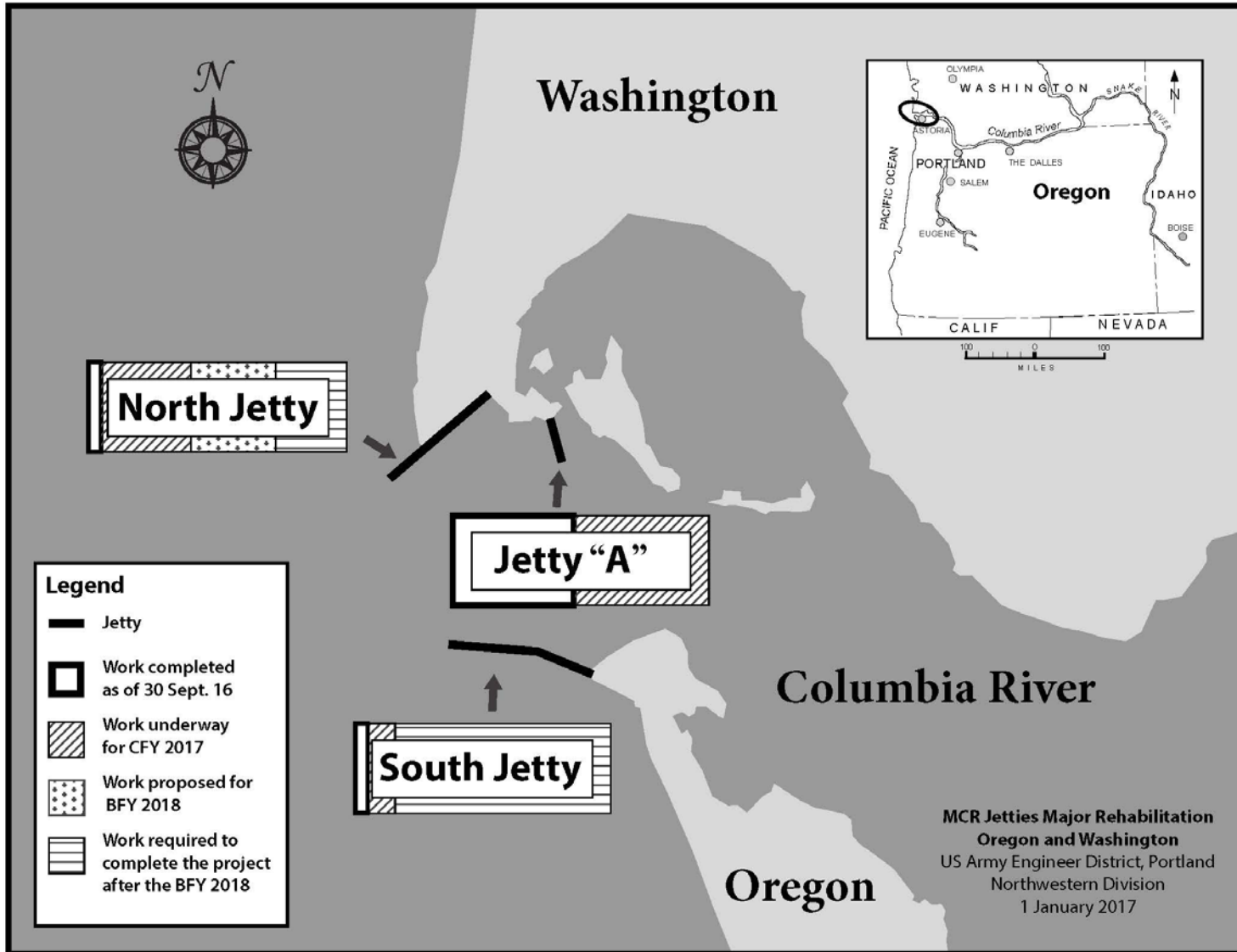
NON-FEDERAL COSTS: The MCR jetty system was authorized prior to the Water Resources Development Act of 1986, and was not subject to cost-sharing in that Act or subsequent law. Therefore, the Federal government will pay 100% of this project's costs.

STATUS OF LOCAL COOPERATION: The MCR jetty system is a 100 percent USACE owned and maintained project. There is no local cooperation required.

COMPARISON OF FEDERAL COST ESTIMATE: The current Federal cost estimate of \$281,774,000 is an increase of \$17,485,000 from the last estimate (\$264,289,000) presented to Congress (FY 2017). This change is due to price escalation in the procurement of the rocks and the length of the construction of the MCR Jetty System.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: An Environmental Impact Statement is not required. An Environmental Assessment was completed June 2012.

OTHER INFORMATION: None.



APPROPRIATION TITLE: Construction – Flood Risk Management, Fiscal Year 2018

PROJECT: East Branch Clarion River Lake, PA (Dam Safety) (Continuing)

LOCATION: The dam is on the East Branch of the Clarion River, 7.5 miles upstream from the junction with the West Branch of the Clarion River at Johnsonburg, Pennsylvania, and 14 miles upstream of Ridgeway, Pennsylvania. The reservoir is located entirely in Elk County, Pennsylvania. The dam was constructed between 1947 and 1952 and has been in continuous operation since December 1952, with one notable exception. During 1957, an episode of internal erosion and piping resulted in emergency drawdown of the reservoir while repairs were made. The dam consists of a 184-foot high earth embankment with a 10-foot diameter concrete lined discharge tunnel, control tower, and an uncontrolled concrete lined side-channel spillway.

DESCRIPTION: Per an October 2010 Dam Safety Modification Report, the project consists of constructing a full length, full depth cut-off wall preceded by a phase of site development. The components of the cut-off consist of grouting of the bedrock, deep soil mixing around the 1957 void repair, and a lean concrete wall approximately 2,145 feet long with a minimum continuous width of 18 inches and approximate maximum depth of 250 feet. The cost of this project is funded at 100 percent Federal expense. All work is programmed.

AUTHORIZATION: Flood Control Acts of 28 June 1938 (P.L. 75-761) and 1944 (P.L. 78-534)

REMAINING BENEFIT – COST RATIO: Not applicable because this is a dam safety project

TOTAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

INITIAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

BASIS OF BENEFIT – COST RATIO: Not applicable because this is a dam safety project

SUMMARIZED FINANCIAL DATA:

		ACCUM PCT OF EST FED COST	STATUS (15 Mar 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE	
Estimated Federal Cost		\$244,500,000		Entire project	45.0	TBD
Programmed Construction	\$244,500,000					
Total Estimated Project Cost		\$244,500,000				
Authorized Cost (plus inflation)		\$280,000,000				
Admin Maximum Cost Limit (Section 902)		\$345,000,000	^{6/}			
Allocations to 30 September 2013		\$ 20,849,100				
Allocation for FY 2014		\$ 20,304,539				
Allocation for FY 2015		\$ 23,573,000				
Allocation for FY 2016		\$ 40,700,000				
Allocation for FY 2017		\$ 56,250,000				
Allocations through FY 2017		\$161,677,000	^{1/2/3/5/}	66.1		
Estimated Unobligated Carry-In Funds		\$ 0	^{4/}			
President's Budget for FY 2018		\$ 50,100,000		86.6		
Programmed Balance to Complete after FY 2018		\$ 32,723,000				
Unprogrammed Balance to Complete after FY 2018		\$ 0				

^{1/} \$1,200,000 reprogrammed from the project.

^{2/} \$0 rescinded from the project.

^{3/} \$0 transferred to the Flood Control and Coastal Emergencies account.

^{4/} Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$400,000. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

^{5/} PED costs of \$0 are included in this amount.

^{6/} For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

PHYSICAL DATA: Construct full length, full depth cut-off wall preceded by a phase of site development. The components of the cut-off consist of grouting of the bedrock and a lean concrete wall approximately 2,300 feet long with a minimum continuous width of 18 inches and approximate maximum depth of 250 feet.

JUSTIFICATION: East Branch Dam was classified as a Dam Safety Action Classification (DSAC) 2, which is defined by ER1110-2-1156 as "High Urgency" where progression toward failure could begin during normal operations or be initiated by an event; or the incremental risk – combination of life or economic consequences with likelihood of failure – is high.

FISCAL YEAR 2017: The appropriated funds, plus carry-in funds, are being applied as follows:

Division: Great Lakes and Ohio River

District: Pittsburgh

East Branch Dam, Clarion River Lake, PA
(Dam Safety)

Description	Amount
Continue cutoff wall construction contract	\$49,620,000
EDC and S&A for continuation of cutoff wall construction	7,030,000
Total	\$56,650,000

FISCAL YEAR 2018: The budget amount, plus carry-in funds, will be applied as follows:

Description	Amount
Continue cutoff wall construction contract	\$41,500,000
EDC and S&A for continuation of cutoff wall construction	8,600,000
Total	\$50,100,000

NON-FEDERAL COSTS: Not applicable.

STATUS OF LOCAL COOPERATION: Not applicable.

COMPARISON OF FEDERAL COST ESTIMATES: The baseline fully funded project cost estimate included in the October 2010 Dam Safety Modification Report was \$280,000,000. The current approved fully funded project cost estimate is \$244,500,000. The current Federal cost estimate of \$244,500,000 is a decrease of \$3,500,000 from the latest estimate (\$248,000,000) presented to Congress (FY 2017). This change includes the following items.

Item	Amount
Reduced LABOR cost estimates	\$3,500,000
Total	\$3,500,000

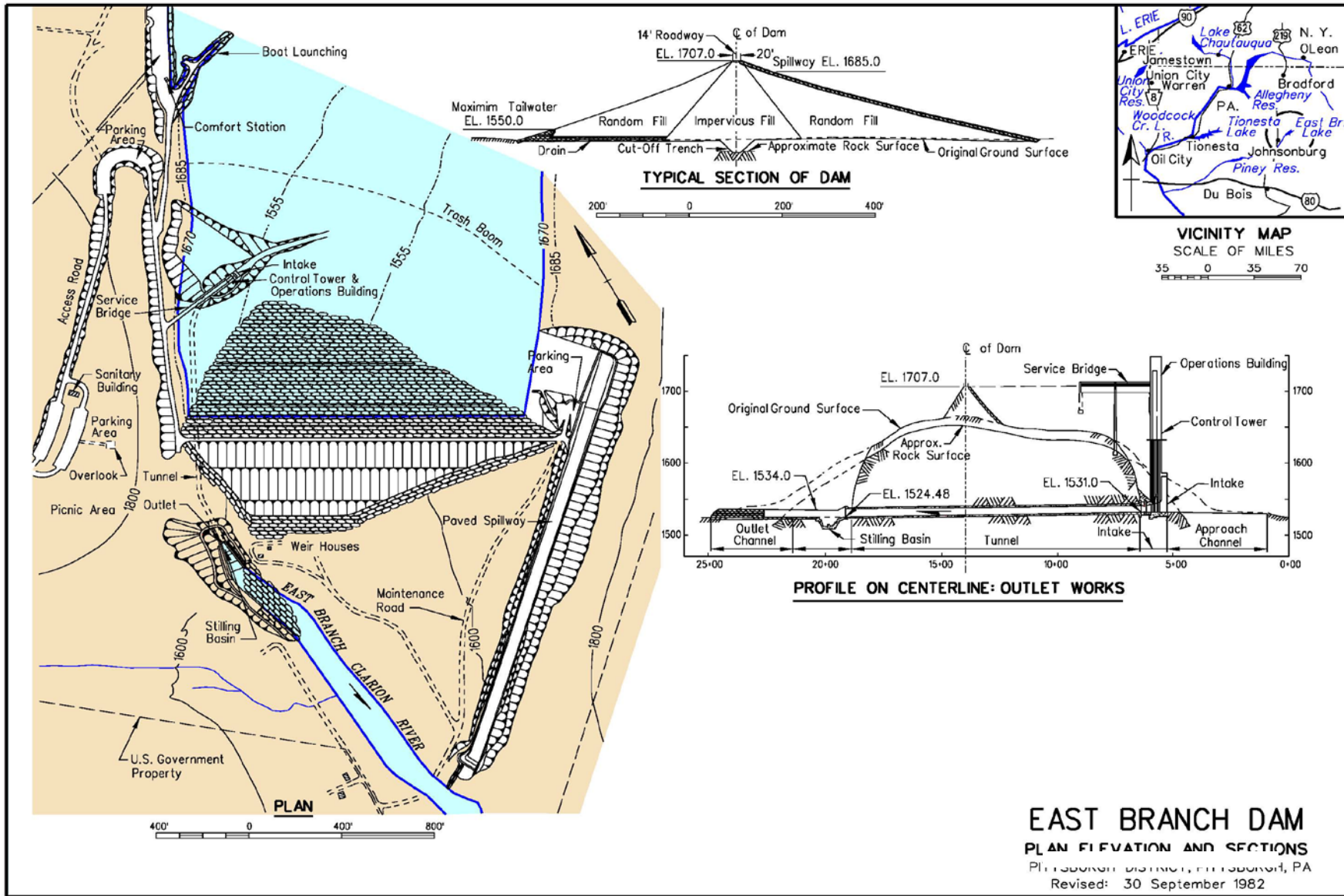
STATUS OF ENVIRONMENTAL IMPACT STATEMENT: The Environmental Assessment was prepared in conjunction with the Dam Safety Modification Report and a Finding of No Significant Impacts was signed by the District Commander on July 1, 2010. The Dam Safety Modification Report was approved on October 22, 2010.

OTHER INFORMATION: Construction funds were first appropriated in FY 2009.

Division: Great Lakes and Ohio River

District: Pittsburgh

East Branch Dam, Clarion River Lake, PA
(Dam Safety)



Division: Great Lakes and Ohio River

District: Pittsburgh

East Branch Dam, Clarion River Lake, PA
 (Dam Safety)

APPROPRIATION TITLE: Construction – Flood Risk Management, Fiscal Year 2018

PROJECT: Center Hill Dam Safety Major Rehabilitation, Caney Fork River, Tennessee (Completion)

LOCATION: Center Hill Dam is located at Mile 26.6 on the Caney Fork River in DeKalb County, Tennessee, 55 miles east and upstream of Nashville, Tennessee.

DESCRIPTION: Center Hill Dam has been in service since 1948 providing flood risk management, hydropower, recreation, water supply and water quality benefits. The dam has a maximum height of 250 feet and consists of a 1,382 feet long concrete section, a 778 feet long compacted clay embankment and a 125 feet high by 770 feet long earthen saddle dam in the right rim. The dam impounds 2,092,000 acre-feet at its maximum flood control pool elevation. Since construction, seepage problems through the karst limestone dam foundation have cost millions of dollars in monitoring, subsurface investigation and grouting. In recent years, seepage has increased. Foundation conditions are deteriorating due to erosion along open and clay-filled joints and solution features in the rock within the rims and dam foundation. Erosion jeopardizes the two earthen embankments, the left abutment and the integrity of the left rim. The initial Major Rehabilitation Evaluation Report (MRER) was completed in 2006 and construction began in 2008. Risk based regulation changes resulted in a 2014 Supplemental MRER and a revised scope approved in March 2015. The recommended plan includes: 1) a grout curtain approximately 3,000 feet long and a maximum depth of 360 feet into the main dam embankment foundation, left groin and left rim; 2) a concrete barrier wall as deep as 310 feet into the main dam embankment foundation; 3) a Roller Compacted Concrete (RCC) Reinforcing berm downstream of the Saddle Dam Embankment; and 4) rehabilitation of Station Service Power House hydropower unit required to mitigate downstream flow loss resulting from the remedial work. All work is complete with the exception of the RCC berm at the Saddle Dam which began in 2016 and is scheduled for completion in 2019. A site restoration contract is also planned for award in 2018. A Post Implementation Evaluation (PIE) risk assessment during 2016 acknowledged significant risk reduced by the completed main dam grouting and barrier wall. The PIE also identified additional credible failure modes associated with operability of the main dam spillway gates and recommended a Supplemental Dam Safety Modification Study (DSMS) be funded within current contingency funds. The Supplemental DSMS is scheduled to be completed in FY 2018, and may recommend additional work at the project to address the operability of the main dam spillway gates.

The cost of this project is initially funded at 100 percent Federal expense from appropriations provided to the U.S. Army Corps of Engineers. Approximately 43.5% of the total project cost will be reimbursed over time to the U.S. Treasury by the Southeastern Power Administration and water supply users, starting when each improvement to the assets (such as the Main Dam and Saddle Dam) is completed and placed into service.

AUTHORIZATION: Section 4, Flood Control Act of 1938 (P.L. 75-761) and Section 1, River and Harbor Act of 1946 (P.L. 79-525)

REMAINING BENEFIT – REMAINING COST RATIO: Not applicable because this is a dam safety project

TOTAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

INITIAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

BASIS OF BENEFIT – COST RATIO: Not applicable because this is a dam safety project

Division: Great Lakes & Ohio River

District: Nashville

Project: Center Hill Dam Safety Major Rehab, TN

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (1 JAN 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE	
Estimated Federal Cost		\$352,994,000				
Programmed Construction	\$352,994,000		Grout Curtain	100	Sep 2010	
Total Estimated Project Cost		\$352,994,000	Cut-off Wall	100	Jul 2015	
Authorized Cost (plus inflation)		\$352,994,000	RCC Berm	5	Apr 2019	
Admin Maximum Cost Limit (Section 902)		\$436,508,000	5/	Entire Project	79	TBD
Allocations to 30 September 2014		\$237,064,000	1/2/3/			
Allocation for FY 2015		\$36,000,000				
Allocation for FY 2016		\$11,000,000				
Allocation for FY 2017		\$40,000,000				
Allocations through FY 2017		\$324,064,000				
Estimated Unobligated Carry-in Funds		\$2,800,000	4/			
President's Budget for FY 2018		\$28,930,000				
Programmed Balance to Complete after FY 2018		\$0				
Unprogrammed Balance to Complete after FY 2018		\$0				

- 1/ \$15,000,000 reprogrammed to Wolf Creek Dam Safety Major Rehabilitation Project in FY 2009. \$1,500,000 reprogrammed to Bolivar Dam in FY 2012.
- 2/ \$0 rescinded from the project.
- 3/ \$4,000,000 transferred to the Flood Control and Coastal Emergencies (FCCE) account in FY 2011.
- 4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$270,000, including \$20,000 committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$2,800,000.
- 5/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

JUSTIFICATION: Center Hill Dam is a Dam Safety Action Classification (DSAC) 1, which is defined by ER 1110-2-1156 as "Very High Urgency" where progression toward failure is confirmed to be taking place under normal operations and the dam is almost certain to fail under normal operations within a few years without intervention; or the incremental risk – combination of life or economic consequences with likelihood of failure – is very high. Continued, uncontrolled seepage creates the potential for dam failure or partial loss of the lake, but progression of seepage through the karst foundation is difficult to accurately predict. Approximately 24 hours warning time is estimated for Metro Nashville. If complete dam failure occurs, the potential depth is 47 feet in Nashville. Failure would destroy interstate bridges over the main east-west route of Interstate 40, and cause loss of water, wastewater facilities, and electrical services. For the total project, including risks to both the Main Dam and Saddle Dam embankments, damages with dam failure are as high as \$2,900,000,000; the Population at Risk is 99,000.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, are being applied as follows:

Division: Great Lakes & Ohio River

District: Nashville

Project: Center Hill Dam Safety Major Rehab, TN

Continue Construction of Saddle Dam Seepage Rehab	\$31,670,000
Supplemental Dam Safety Modification Study for Gate Operability	\$400,000
Construction Management	\$4,000,000
Site Restoration	\$1,400,000
Total	\$37,470,000 4/

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, is a total of \$31,730,000. These funds will be used to complete construction of the Saddle Dam Seepage Rehab; complete Supplemental Dam Safety Modification Study for Gate Operability; complete site restoration contracts; and for construction management, and contract administrative and fiscal close-outs.

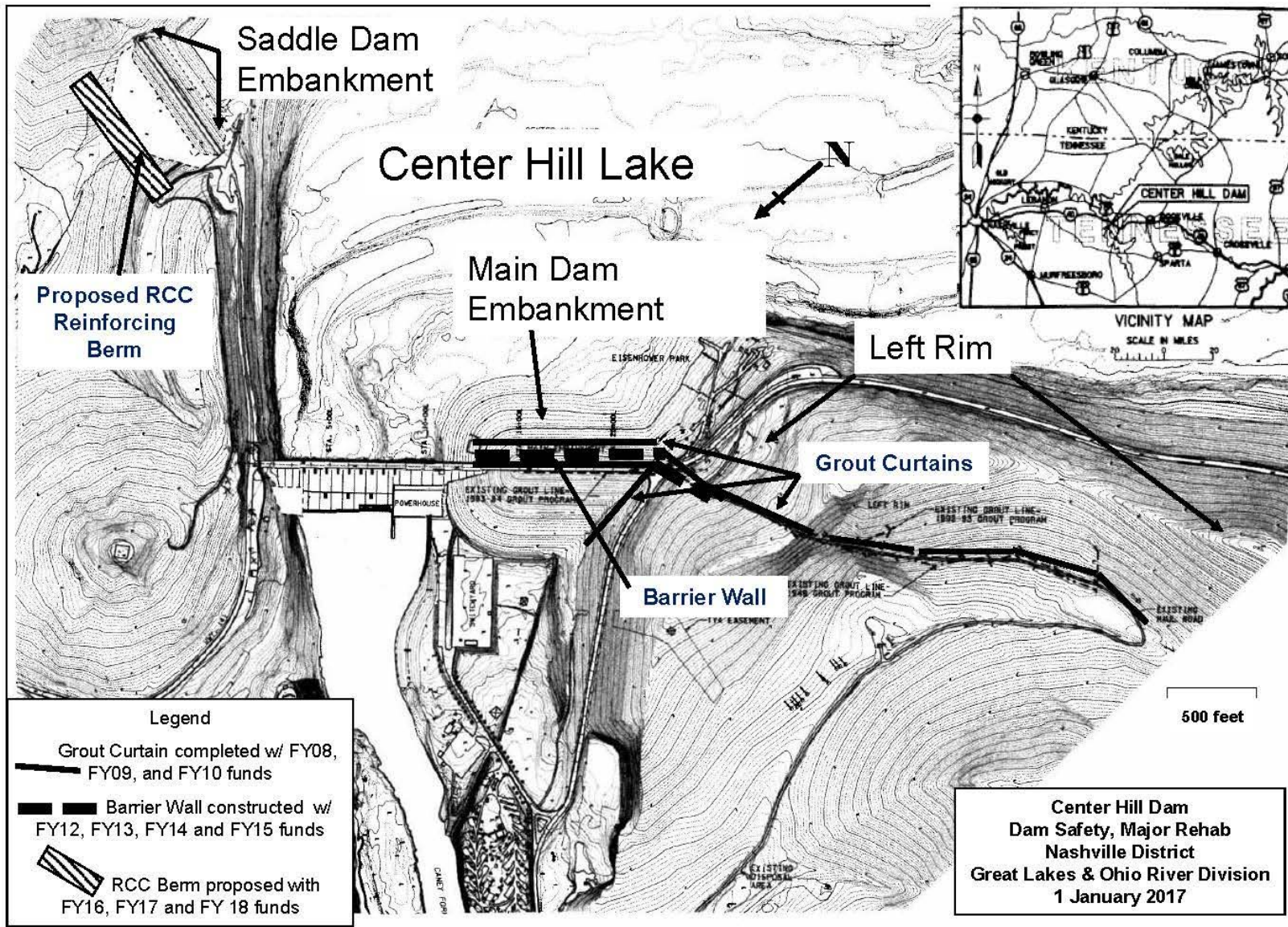
STATUS OF LOCAL COOPERATION: There are two classes of users that will be required to reimburse a portion of the final cost of this project: the water supply and hydropower customers. Four water supply users currently have signed agreements with USACE, Nashville District. The users include the Cities of Cookeville and Smithville, and DeKalb County Utility District. A fourth water supply user, North Alabama Bank, has executed a Surplus Agreement which includes annual repayments. Hydropower from the project is marketed through the Southeastern Power Administration (SEPA). Both water supply customers and SEPA will reimburse their share of the costs over time, in accordance with the terms of their agreements, by periodic direct payment to the U.S. Treasury.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$352,994,000 is a decrease of \$11,206,000 from the latest estimate (\$364,200,000) presented to Congress (FY 2017). This change includes the following items:

Item	
Post Contract Award and Other Estimating Adjustments (including contingency adjustments)	(\$11,206,000)
Total	(\$11,206,000)

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: An environmental assessment (EA) was completed early in the study process and a finding of no significant impact (FONSI) was signed in July 2005. An EA Supplement was completed to address additional alternatives and the FONSI was signed in May 2006. A second supplemental EA was completed in December 2007 to address specific grouting methods proposed by potential construction contractors. An EIS evaluating lower lake level alternatives during construction was completed in November 2007 and a Record of Decision (ROD) was signed in February 2008. Another EA Supplement was completed in FY 2014 to evaluate the Roller Compacted Concrete (RCC) reinforcing berm alternative for the Saddle Dam rehab portion of the project. A FONSI was signed 9 January 2014.

OTHER INFORMATION: Design for construction began in FY 2007 utilizing Dam Safety and Seepage/Stability Correction Program funds. The risk-based current scope changes documented in the 2014 Supplemental MRER were approved March 10, 2015. The main dam completed works were placed in service at the end of 2015 and water supply customers have paid in full for work on the main dam.



Division: Great Lakes & Ohio River

District: Nashville

Project: Center Hill Dam Safety Major Rehab, TN

APPROPRIATION TITLE: Construction - Local Protection (Flood and Coastal Storm Damage Reduction) Fiscal Year 2018

PROJECT: Buffalo Bayou and Tributaries, Addicks and Barker Reservoirs, Houston, TX (Dam Safety) (Continuing)

LOCATION: The Addicks and Barker Reservoirs are located in southeast Texas in the San Jacinto River basin approximately 17 miles west of downtown Houston. The reservoirs are strategically located above the confluence of Buffalo Bayou and South Mayde Creek. Beyond this confluence, Buffalo Bayou continues east through downtown Houston, where it joins with White Oak Bayou, and eventually becomes the Houston Ship Channel, which flows into San Jacinto Bay. The majority of both Addicks and Barker Reservoirs fall within Harris County; however, a small portion of Barker Reservoir crosses into Fort Bend County.

DESCRIPTION: The project consists of the Addicks and Barker Reservoirs. The Addicks and Barker Reservoir project features include an earthen dam embankment, gated concrete conduits and outlet works, and uncontrolled spillways at the ends of the earthen dam embankment. The 2013 Dam Safety Modification Report indicated high risk associated with the seepage and piping beneath, around, and near the outlet works structure conduits at both Addicks and Barker Dams. The recommended plan consists of the construction of a new outlet structure, parabolic spillway, stilling basin and outlet channel and grouting and abandoning the existing outlet structure in place. The new outlet structure would be located within the existing dam embankment approximately 400 feet from the existing outlet structure. The new outlet structure for Addicks includes three 10-foot diameter steel lined conduits with 10 by 10-foot rectangular steel gates at the intakes. The new outlet structure for Barker includes three 12-foot diameter steel lined conduits with 12 by 12-foot rectangular steel gates at the intakes. A 1,400-foot long cement bentonite slurry cut-off wall will also be constructed along the upstream embankment of Barker Dam at Noble Road to address seepage issues at this location. The onsite mitigation plan to compensate for unavoidable impacts due to construction of the recommended plan includes reestablishing 54.4 acres of scrub-shrub wetland habitat, 6.8 acres of emergent wetland, and 6.8 acres of open water within the footprint of the Barker Dam borrow area after replacement of fill removed for construction, through planting of native vegetation, and by controlling invasive, noxious, and /or exotic plant species. The cost of this project is funded at 100 percent Federal expense. All work is programmed.

AUTHORIZATION: House Document 456, 75th Congress, 2nd Session in 1938, and modified by the 1939 Flood Control Act and again modified in the 1954 Flood Control Act.

REMAINING BENEFIT-REMAINING COST RATIO: Not applicable.

TOTAL BENEFIT-COST RATIO: Not applicable since the project is a dam safety assurance project.

INITIAL BENEFIT-COST RATIO: Not applicable since the project is a dam safety assurance project.

BASIS OF BENEFIT-COST RATIO: Not applicable since the project is a dam safety assurance project.

Division: Southwestern

District: Galveston

Buffalo Bayou and Tributaries,
Addicks and Barker Dam (Dam Safety), TX

SUMMARIZED FINANCIAL DATA	CONSTRUCTION GENERAL APPROPRIATION	ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT Cmpl	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost	\$ 104,859,000		Entire Project	20%	TBD
Estimated Non-Federal Cost	0				
Cash Contribution	\$0				
Other Costs	0				
Total Estimated Project Cost	\$ 104,859,000				
Authorized Cost (plus inflation)	\$ 110,115,000	7/			
Admin Maximum Cost Limit (Section 902)	\$ 154,460,000	6/			
Allocations to 30 September 2014	\$ 5,625,000				
Allocation for FY 2015	23,993,000				
Allocation for FY 2016	36,410,000				
Allocation for FY 2017	13,300,000				
Allocations through FY 2017	79,328,000	1/ 2/ 3/ 5/	76%		
Estimated Unobligated Carry-In Funds	0	4/			
President's Budget for FY 2018	16,500,000		91%		
Programmed Balance to Complete after FY 2018	9,031,000				
Un-programmed Balance to Complete after FY 2018	\$ 0				

1/ \$0 reprogrammed to (from) the project.

2/ \$0 rescinded from the project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$943,000, including \$216,000 committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this effort is \$0.

5/ PED cost of \$7,828,000 are included in this amount.

6/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

7/ Authorized Cost based on the 2013 DSMR – Buffalo Bayou & Tributaries, Addicks & Barker Dams, Houston, TX, and the DSMR Supplemental Report-March 2015

PHYSICAL DATA:

Addicks 11.6 miles earthen embankment, 53.5 feet high, five 8 feet by 6 feet gated concrete conduits.

Barker 13.6 miles earthen embankment, 42.9 feet high, five 9 feet by 7 feet gated concrete conduits.

JUSTIFICATION: Addicks and Barker Dams is a Dam Safety Action Classification (DSAC) 1, which is defined by ER 1110-2-1156 as "Very High Urgency" where

Division: Southwestern

District: Galveston

Buffalo Bayou and Tributaries,
Addicks and Barker Dam (Dam Safety), TX

progression toward failure is confirmed to be taking place under normal operations, and the dam is almost certain to fail under normal operations within a few years without intervention; or the incremental risk – combination of life or economic consequences with likelihood of failure – is very high. Because of the location of Addicks and Barker Dams, on the western edge of Houston, TX, the consequences of a failure, should one occur, would be significant. The population at risk is 1.2 million people with potential economic losses estimated at \$60 billion.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, are being applied as follows:

Continue construction of new Outlet Work Structure at Addicks and Barker Dams	\$ 9,360,000
Engineering and Design during Construction	1,523,000
Construction Management	3,360,000
 Total	 \$14,243,000

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

Continue construction of new Outlet Work Structure at Addicks and Barker Dams	\$12,067,000
Engineering and Design during Construction	2,127,000
Construction Management	2,306,000
 Total	 \$16,500,000

NON-FEDERAL COST: Project is owned by the Federal government, therefore there are no cost-sharing requirements.

STATUS OF LOCAL COOPERATION: Not applicable

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$104,859,000 is the same as the latest estimate (\$104,859,000) presented to Congress (FY 2017).

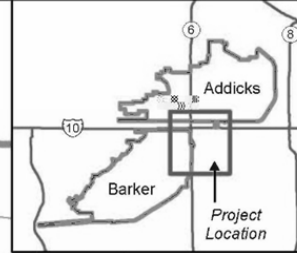
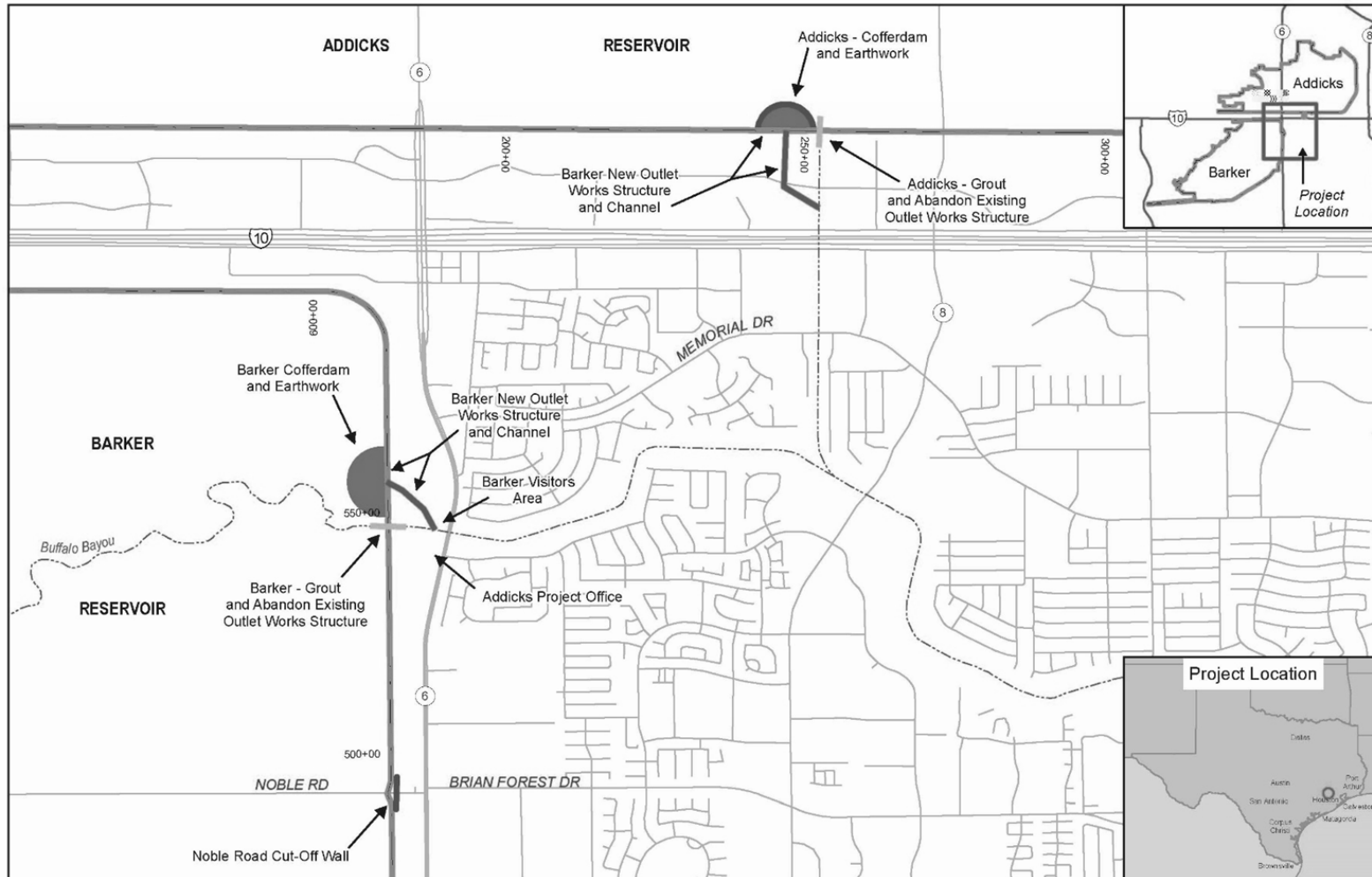
STATUS OF ENVIRONMENTAL IMPACT STATEMENT: The reservoirs were constructed in the 1940s before the passage of the National Environmental Policy Act (NEPA). An Environmental Assessment (EA) for the new Master Plan for the reservoirs was completed in 2009. The Final EA and FONSI were signed for the DSM study in July 2013. A Memorandum for Record (MFR) was prepared in June 2015 to document and address changes in project impacts and coordinate revised ecosystem modeling and mitigation with the resource agencies. It was concurred that the changed impacts were not substantively different from those coordinated in the 2013 EA and so no additional formal NEPA coordination is necessary.

OTHER INFORMATION: Funds for preconstruction engineering and design were funded out of the Dam Safety and Seepage Stability Correction Program remaining item in FY 2014.

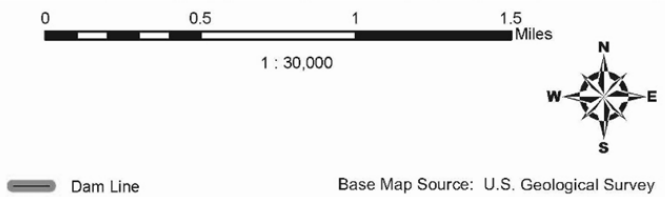
Division: Southwestern

District: Galveston

Buffalo Bayou and Tributaries,
Addicks and Barker Dam (Dam Safety), TX



- Work Completed as of 30 Sept. 2016
- Work Proposed with Funds Available for FY17
- Work Proposed with Funds Available for FY18
- Work Required to Complete the Project After FY18



**BUFFALO BAYOU, TX
ADDICKS & BARKER DAMS**

January 1, 2017

**U.S. ARMY CORPS OF ENGINEERS
GALVESTON, TEXAS**

Division: Southwestern

District: Galveston

Buffalo Bayou and Tributaries,
Addicks and Barker Dam (Dam Safety), TX

APPROPRIATION TITLE: Construction, Environment, Fiscal Year 2018

PROJECT: Columbia River Fish Mitigation, Washington, Oregon, & Idaho (Continuing)

LOCATION: Lower Columbia, Snake and Willamette Rivers.

DESCRIPTION: The Columbia River Fish Mitigation program is funded at 100 percent Federal cost and is comprised of efforts by the Corps to address the Endangered Species Act Biological Opinion (BiOp) Reasonable and Prudent Alternative (RPA) actions identified in the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) 2014 Federal Columbia River Power System (FCRPS) BiOp and the 2008 Willamette River BiOp's specified by NOAA Fisheries and the U.S. Fish and Wildlife Service (USFWS). In addition, the Corps entered into the 2008 Columbia River Basin Fish Accords that represent a commitment to improve passage of Pacific Lamprey (Lamprey) at the lower Snake and lower Columbia River dams; these actions are not included under the BiOp.

The BiOp RPA actions address the effects of the operation and maintenance of the Corps' FCRPS and Willamette River projects in order to avoid jeopardy of ESA-listed species and adverse modification of designated critical habitat.

The BiOp on the FCRPS was issued in 2000 and was remanded by the Court to NOAA Fisheries. A new BiOp was issued in 2004 which was also remanded. A subsequent BiOp was issued in 2008, which was also remanded and supplemented in 2010. On August 2, 2011, the U.S. District Court ruled that the 2008/2010 Supplemental BiOp remain in place through 2013, and NOAA Fisheries issued the 2014 FCRPS Supplemental BiOp on January 17, 2014 to correct the 2008/2010 Supplemental BiOp's reliance on post-2013 measures that the court concluded were unidentified and not reasonably certain to occur. On May 4, 2016 the U.S. District Court of Oregon remanded the 2014 BiOp and ordered a new BiOp by 31 December 2018. The Court also ordered the Corps and Bureau of Reclamation to continue to implement all RPA actions in the 2014 BiOp until the new 2018 BiOp is complete. Current RPA actions include adult and juvenile fish passage improvements, as well as avian predation management and salmon survival research and development.

Biological Opinions for the Willamette River Basin were issued in July 2008 by both NOAA Fisheries and the USFWS. RPA actions include adult and juvenile fish passage improvements and research, monitoring and evaluation to provide information necessary to make informed adaptive management decisions in addition to tracking and documenting progress made toward achievement of RPA measures.

AUTHORIZATION:

FCRPS and Pacific Lamprey: 1933 Federal Emergency Administration of Public Works; 1935, 1945 and 1950 River and Harbor Acts; 1937 Bonneville Project Act; 1938, 1948, 1950 and 1954 Flood Control Acts; Water Resources Development Act (WRDA) 1986, Section 906(b)(1); WRDA 1996, Section 511, as amended by WRDA 1999, Section 582 and WRDA 2007, Section 5025.

Estuary Research, Monitoring, and Evaluation: The authorized cost of estuary actions under Section 511(a) of WRDA 1996 is increased in the FY 2015 Appropriations Bill.

Willamette River: 1938, 1950 and 1960 Flood Control Acts; 1937 Bonneville Project Act; WRDA 1996 Section 101 (a) 25, as amended by Section 344 of WRDA 1999.

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

REMAINING BENEFIT-REMAINING COST RATIO: The remaining benefit-remaining cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

TOTAL BENEFIT-COST RATIO: The total benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

INITIAL BENEFIT-COST RATIO: The initial benefit-cost ratio for this project is not applicable because environmental benefits were not quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: The basis of benefit-cost ratio is not applicable to this project because environmental benefits were not quantified in monetary terms.

SUMMARIZED FINANCIAL DATA			ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT COMPL	PHYSICAL COMPLETION SCHEDULE
<u>Total Project Summary</u>						
Estimated Appropriation Requirement (Corps of Engineers)	2,786,105,000			Entire Project	71%	TBD
Estimated Other Federal Costs [Bonneville Power Administration (BPA)]	9,670,000			FCRPS	89%	TBD
				Lamprey	81%	TBD
				Willamette River	23%	TBD
Total Federal Cost	2,795,775,000					
Future Non-Federal Reimbursement	1,936,022,000	6/				
Estimated Federal Cost (Ultimate)	850,083,000					
Estimated Non Federal Cost	1,936,022,000					
Cash Contributions	0					
Other Costs	0					
Reimbursements, Power	1,936,022,000					
Total Estimated Project Cost	2,795,775,000					
Allocations to 30 September 2014	1,904,425,000	11/				
Allocation for FY 2015	73,600,000	10/				
Allocation for FY 2016	84,414,000					
Allocation for FY 2017	70,300,000					
Allocations through FY 2017	2,132,739,000	1/ 2/ 3/	77%			
Unobligated Carry-In Funds	0	4/				
President's Budget for FY 2018	70,000,000		79%			
Programmed Balance to Complete after FY 2018	583,366,000					
<u>FCRPS</u>						
Estimated Appropriation Requirement (Corps of Engineers)	1,984,845,000					
Estimated Other Federal Costs (BPA)	9,670,000					
Total Federal Cost	1,994,515,000					
Future Non-Federal Reimbursement	1,633,998,000	6/				
Estimated Federal Cost (Ultimate)	350,847,000					
Estimated Non Federal Cost	1,633,998,000					
Cash Contributions	0					
Other Costs	0					
Reimbursements, Power	1,633,998,000					
Total Estimated Project Cost	1,994,515,000	7/				

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

Allocations to 30 September 2014	1,722,468,000	9/ 11/	
Allocation for FY 2015	54,090,000		
Allocation for FY 2016	48,742,000		
Allocation for FY 2017	46,225,000		
Allocations through FY 2017	1,871,525,000	5/	94%
Unobligated Carry-In Funds	0	<u>4/</u>	
President's Budget for FY 2018	45,048,000		97%
Programmed Balance to Complete after FY 2018	68,272,000	<u>7/</u>	
Unprogrammed Balance to Complete after FY 2018	0		

Pacific Lamprey

Estimated Appropriation Requirement (Corps of Engineers)	52,235,000		
Estimated Other Federal Costs (BPA)	0		
Total Federal Cost	52,235,000		
Future Non-Federal Reimbursement	42,310,000	6/	
Estimated Federal Cost (Ultimate)	9,925,000		
Estimated Non Federal Cost	42,310,000		
Cash Contributions	0		
Other Costs	0		
Reimbursements, Power	42,310,000		
Total Estimated Project Cost	52,235,000	10/	

Allocations to 30 September 2014	37,409,000	8/	
Allocation for FY 2015	1,251,000	<u>9/</u>	
Allocation in FY 2016	4,415,000		
Allocation for FY 2017	5,255,000		
Allocations through FY 2017	48,330,000	5/	93%
Unobligated Carry-In Funds	0	<u>4/</u>	
President's Budget for FY 2018	4,632,000		98%
Programmed Balance to Complete after FY 2018	0		
Unprogrammed Balance to Complete after FY 2018	0		

Willamette River

Estimated Appropriation Requirement (Corps of Engineers)	749,025,000	<u>8/</u>	
Estimated Other Federal Costs (BPA)	0		
Total Federal Cost	749,025,000		
Future Non-Federal Reimbursement	259,714,000	6/	

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

Estimated Federal Cost (Ultimate)	489,311,000		
Estimated Non Federal Cost		259,714,000	
Cash Contributions	0		
Other Costs	0		
Reimbursements, Power	259,714,000		
Total Estimated Project Cost		749,025,000	<u>7/</u>
Allocations to 30 September 2014		144,548,000	<u>9/</u>
Allocation for FY 2015		18,259,000	
Allocation for FY 2016		31,258,000	
Allocation for FY 2017		18,820,000	
Allocations through FY 2017		212,885,000	5/ 28%
Unobligated Carry-In Funds		0	<u>4/</u>
President's Budget for FY 2018		20,320,000	31%
Programmed Balance to Complete after FY 2018		515,820,000	<u>7/</u>
Unprogrammed Balance to Complete after FY 2018		0	

1/ \$31,465,000 reprogrammed to the project (\$886,000 reprogrammed from the project FY 2016).

2/ \$3,407,000 rescinded from the project.

3/ \$200,000 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY2017 was \$13,523,000, including \$147,000 committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into Fiscal Year 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$0 are included in this amount.

6/ Allocation for actual reimbursement by the BPA is made as each element is placed in service.

7/ See Other Information.

8/ See Comparison of Federal Cost Estimate.

9/ Allocation for FY14 includes net reprogramming into the project of \$1,473,000.

10/ Reflects revocation of \$600,000 from Lamprey allocations prior to 2013 due to reimbursement of A/E liability settlement on a design funded with ARRA funds.

11/ Allocations thru 2014 include \$28,064,000 made from 1988 thru 1990 to address FCRPS improvements for juvenile salmon migration, referred to as the Columbia River Basin Fish Bypass Program in Congressional Reports, prior to the establishment of the Columbia River Fish Mitigation program.

PHYSICAL DATA:

FCRPS

Lower Granite Lock & Dam
 Juvenile fish bypass system
 Juvenile fish transport facilities
 Barge moorage
 Fish transport barges
 Spillway flow deflectors
 Spillway weir
 Juvenile passage monitoring facilities
 Adult fish ladders
 Adult passage monitoring facilities

Little Goose Lock & Dam
 Juvenile fish bypass system
 Adult fish ladders
 Spillway flow deflectors
 Spillway weir
 Juvenile fish transport facilities

Lower Monumental Lock & Dam
 Juvenile fish bypass system
 Juvenile fish transport facilities
 Spillway flow deflectors
 Spillway weir
 Juvenile passage monitoring facilities
 Adult fish ladders

The Dalles Lock & Dam
 Tailrace spill wall
 Spillway improvements
 Sluiceway surface passage
 Adult fish ladders

McNary Lock & Dam
 Juvenile fish bypass system
 Juvenile fish transport facilities
 Juvenile passage monitoring facilities
 Spillway flow deflectors
 Spillway weirs
 Adult fish ladders
 Adult passage monitoring facilities

John Day Lock & Dam
 Juvenile fish bypass system
 Juvenile passage monitoring facilities
 Spillway flow deflectors
 Spillway weirs
 Adult fish ladders
 Mitigation hatcheries

Ice Harbor Lock & Dam
 Juvenile fish bypass system
 Spillway flow deflectors
 Spillway weir
 Juvenile passage monitoring facilities
 Adult fish ladders

Bonneville Lock and Dam
 Juvenile fish bypass system
 Independent station service
 Juvenile fish monitoring facilities
 Corner collector surface passage
 Spillway flow deflectors
 Sea lion barriers
 Adult fish ladders
 Adult passage laboratory
 Adult passage monitoring facilities
 Sluiceway surface passage

Mitigation Analysis
 Gas abatement
 Adult passage
 Turbine Passage
 Project passage efficiency and survival studies
 Prototype facility studies
 Delayed & multiple bypass mortality studies
 Temperature impacts

Lower Columbia River estuary
 Avian Predation Reduction
 Estuary Studies

Pacific Lamprey

Lower Granite Lock & Dam
Minor Adult Ladder Modifications

McNary Lock & Dam
Minor Adult Ladder Modifications
South Shore Adult Ladder Entrance
JBS Raceway Tail Screens

Bonneville Lock and Dam
Cascade Island Lamprey Passage Structure
WA Shore Adult Ladder Flume System
Adult Count Station Picketed Lead Modifications
Minor Adult Ladder Modifications

Little Goose Lock & Dam
Minor Adult Ladder Modifications
Adult Ladder Entrance Modifications

John Day Lock & Dam
North Adult Fish Ladder
Adult Lamprey Trap
Minor Adult Ladder Modifications

The Dalles Lock and Dam
Minor Adult Ladder Modifications

Lower Monumental Lock & Dam
Minor Adult Ladder Modifications
Adult Ladder Entrance Modifications

Ice Harbor Lock & Dam
Minor Adult Ladder Modifications
Adult Ladder Entrance Modifications
Turbine Cooling Water Intake Screens

Mitigation Analysis
JSATs Juvenile Lamprey Tag
Adult Passage Studies
Juvenile Passage and Success Studies

Willamette River (By Sub-Basin)

North Santiam River
Adult Passage
Juvenile Downstream Passage
Temperature Control
Research, Monitoring and Evaluation

South Santiam River
Adult Passage
Juvenile Downstream Passage
Temperature Control
Research, Monitoring and Evaluation

Middle Fork Willamette River
Adult Passage
Research, Monitoring and Evaluation

McKenzie River
Juvenile Downstream Passage
Research, Monitoring and Evaluation

System Wide
Configuration and Operation Plan
System wide Research, Monitoring and Evaluation

JUSTIFICATION: The NOAA Fisheries has listed salmon and steelhead as threatened/ endangered and has issued BiOp(s) on operation of the FCRPS issued 1992, 1993, 1995, 1998, 2000, 2004, 2008, the 2010 Supplemental BiOp which includes the Adaptive Management Implementation Plan and amendments, and the 2014 FCRPS Supplemental BiOp. The current scope of this project has been adjusted to be in accord with biological opinions and specific dates for Reasonable and Prudent Alternative (RPA) actions identified in the BiOp(s). The Mitigation Analysis, begun in FY 1991, is contributing to a regionally collaborative process for analyzing the RPA actions and their efficacy for avoiding jeopardy of ESA-listed species and adverse modification of designated critical habitat.

In response to Section 582 of WRDA 1999 and in recognition of the effects of the hydropower system operations on the Columbia River estuary and concomitant impacts on salmonids, efforts began in FY 2001 to conduct monitoring, research, and evaluation of habitat and avian predation issues in the estuary. From FY 2008 to FY 2013, under the authority of Section 906b of WRDA 1986, the Corps initiated actions to relocate a portion of the Caspian Tern colony in the estuary to reduce predation on migrating juvenile salmonids. Starting in FY 2014, avian predation actions are being funded under the authority of Sec 511(c) of WRDA 1996. This authority was further amended by WRDA 2007, Section 5025, to increase the funding cap for research and development from \$10 million to \$25 million and to increase the funding cap for avian predation from \$1 million to \$10 million. The research and development authority (511a) was further amended to \$43.4 million in the 2015 Omnibus.

Pacific Lamprey: As a result of the May 2008 Columbia Basin Fish Accords, increased efforts to investigate and improve juvenile and adult Pacific lamprey passage and survival at the FCRPS dams was initiated in FY 2009 with the goal to complete significant improvements by 2018.

Willamette River: Separate Biological Opinions on the Willamette River were issued by NOAA Fisheries and the USFWS in July 2008. The Corps has initiated actions to comply with the most urgent BiOp requirements and is additionally completing the Willamette River Configuration and Operations Plan and associated BiOp compliance 5-year strategic plan to further recommend appropriate structural and operational changes to the Willamette River Basin to address impacts on listed species resulting from the operation of the 13 Dams in the basin. These plans will inform the cost estimate to comply with the BiOps.

FISCAL YEAR 2017: The Fiscal Year 2017 funds, plus carry-in funding, will be applied to address the highest priority actions to comply with the 2014 FCRPS Supplemental BiOp requirements, the NOAA Fisheries and USFWS 2008 BiOps for the Willamette River Basin, and the 2008 Columbia Basin Fish Accords. No funds are included for conservation measures or for work that will require additional authorization to complete. Current execution plans are for funds to be applied on major measures as follows (Specific amounts are tentative. See "Other Information" below):

<u>FCRPS</u>			
Lower Granite	\$14,272,000	John Day	3,422,000
Juvenile facility bypass improvements		Adult PIT monitoring	
Outfall relocation		North shore adult ladder improvements	
Spillway PIT tag detection		Mitigation alternatives	
Surface passage alternative		Avian wire array	
Spillway weir boat barrier			
Little Goose	4,610,000	The Dalles	6,570,000
Fully automated spillway weir		Emergency adult ladder aux water supply	
Spillway weir boat barrier			
Adult ladder temperature mitigation			
Lower Monumental	0	Bonneville	700,000
		Gateway orifice modifications	
		Floating orifice gate permanent closure	
Division: Northwestern	District(s): Portland/Walla Walla	Columbia River Fish Mitigation, WA, OR, & ID	

Ice Harbor	2,300,000	Lower Columbia River Estuary	4,350,000
Biological Assessments for Unit 2 and 3 replacement		Avian predator relocation	
		Habitat Studies	
McNary	500,000	Mitigation Analysis, FCRPS	22,512,000
Spillway weir permanence		Tagging studies, Fall Chinook studies,	
Avian bird cannon		Adult passage and survival studies	
		Turbine passage survival, Inland avian predation	
		PIT tag recovery, post-FCRPS survival study	
		FCRPS performance verification, FCRPS NEPA	
			=====
		Subtotal FCRPS	\$59,236,000

<u>Pacific Lamprey</u>			
Bonneville Dam	\$1,860,000	McNary Dam	195,000
Adult Lamprey Passage Structures		Minor Adult Ladder Modifications	
Minor Adult Ladder Modification			
Ice Harbor Dam	150,000	The Dalles Dam	245,000
South Shore Adult Ladder Entrance		Minor Adult Ladder Modifications	
Cooling Water Strainer Exclusion			
		Mitigation Analysis	2,805,000
		Adult Passage Studies	
		Juvenile Passage Studies	
			=====
		Subtotal Pacific Lamprey	\$5,255,000
<u>Willamette River</u>			
North Santiam River	\$2,620,000	South Santiam River	4,380,000
Juvenile Downstream Passage		Juvenile Downstream Passage	
Adult Passage (Minto)		Adult Passage (Foster)	
Middle Fork Willamette River	3,400,000	McKenzie River	800,000
Adult Passage (Fall Ck)		Juvenile Downstream Passage	
System Wide	7,985,000		
Configuration and Operations Planning			
High head bypass			
Portable floating fish collector			
Research, Monitoring and Evaluation			
			=====
		Subtotal Willamette River	\$19,185,000
		TOTAL FISCAL YEAR 2017	\$83,676,000

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

FISCAL YEAR 2017: The requested amount will be applied to address the highest priority actions to comply with the 2014 FCRPS Supplemental BiOp requirements, the NOAA Fisheries and USFWS 2008 BiOps for the Willamette River Basin, and the 2008 Columbia Basin Fish Accords. Funds to complete work in the Lamprey program are included. No funds are included for conservation measures or for work that will require additional authorization to complete. Current execution plans are for funds to be applied on major measures as follows (Specific amounts are tentative. See "Other Information" below):

<u>FCRPS</u>			
Lower Granite	\$6,135,000	John Day	600,000
Juvenile facility bypass improvements		Avian wire array	
Spillway PIT tag detection			
Surface passage alternative			
Little Goose	1,025,000	The Dalles	3,000,000
Fully automated spillway weir		Emergency adult ladder aux water supply	
Spillway weir boat barrier			
Adult ladder temperature mitigation			
Lower Monumental	500,000	Bonneville	0
Outfall primary bypass expansion joint			
Ice Harbor	215,000	Lower Columbia River Estuary	7,130,000
Biological Assessments for Unit 2 and 3 replacement		Avian predator relocation	
		Habitat Studies	
McNary	3,250,000	Mitigation Analysis, FCRPS	23,193,000
Spillway weir permanence		Tagging studies, Fall Chinook studies,	
Avian bird cannon		Adult passage and survival studies	
		Turbine passage survival, Inland avian predation	
		PIT tag recovery, post-FCRPS survival study	
		FCRPS performance verification, FCRPS NEPA	
		FCRPS gas cap spill effects study	
			=====
		Subtotal FCRPS	\$45,048,000

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

<u>Pacific Lamprey</u>			
Bonneville Dam	\$1,097,000	Ice Harbor Dam	440,000
Adult Lamprey Passage Structures		South Shore Adult Ladder Entrance	
Minor Adult Ladder Modification		Cooling Water Strainer Exclusion	
The Dalles Dam	335,000	Mitigation Analysis	2,760,000
Minor Adult Ladder Modification		Adult Passage Studies	
		Juvenile Passage Studies	
			=====
		Subtotal Pacific Lamprey	\$4,632,000
 <u>Willamette River</u>			
North Santiam River	\$2,500,000	South Santiam River	500,000
Juvenile Downstream Passage		Juvenile Downstream Passage	
Middle Fork Willamette River	1,000,000	McKenzie River	2,500,000
Adult Passage (Fall Ck)		Juvenile Downstream Passage	
System Wide	13,820,000		
Configuration and Operations Planning			
High head bypass			
Portable floating fish collector			
Research, Monitoring and Evaluation			
			=====
		Subtotal Willamette River	\$20,320,000
		TOTAL FISCAL YEAR 2018	\$68,448,000

Division: Northwestern

District(s): Portland/Walla Walla

Columbia River Fish Mitigation, WA, OR, & ID

NON-FEDERAL COST: Costs eventually determined to be allocable to power are reimbursable. The dams being modified and analyzed are a part of the FCRPS. BPA, the Federal Power Marketing Agency, establishes system rate levels adequate to recover all capital investment costs for generating projects (including Corps generating projects) within a 50-year period and to repay annual OM&R and interest expenses. BPA submits an annual financial statement to Congress, as required by law, on repayment and periodically recommends rate adjustments as required for meeting repayment obligations.

STATUS OF LOCAL COOPERATION: None required.

COMPARISON OF FEDERAL COST ESTIMATE: The total Federal cost estimate of \$2,795,775,000 remains unchanged from the last estimate presented to Congress (FY 2017). The sub-program total for Pacific Lamprey is increased by \$645,000 to \$52,235,000 due to cost increases in construction and follow on modifications needed to make the adult lamprey passage systems successful and sustainable. To offset this increase, the FCRPS sub-program is reduced by \$645,000 to \$1,994,515,000 by decreasing the estimated contingency on remaining actions.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: On 4 May 2016 the United States District Court for the District of Oregon issued an Opinion and Order ruling that the FCRPS Action Agencies must prepare a comprehensive Environmental Impact Statement (EIS) addressing all reasonable alternatives. On 6 July 2016 the Court issued an Order of Remand with the deadline to complete the Final EIS established by the Court is March 26, 2021 with a Record of Decision issued on or before September 24, 2021.

OTHER INFORMATION: Funds to initiate construction were appropriated in Fiscal Year 1988.

FCRPS: The total project cost estimate was updated to consider remaining FCRPS BiOp RPA actions to avoid jeopardy to ESA listed species and adverse modification of designated critical habitat, cost and schedule risk, and escalation factors.

Willamette River: Actions and costs necessary to avoid jeopardy to ESA-listed species and adverse modification of designated critical habitat in the Willamette River Basin were evaluated and a compliance strategy was developed in FY 2015. Future actions to address RPA requirements for upstream and downstream passage in the main stem Middle Fork Willamette River are not included in the total cost estimate as feasibility has not been determined at this time. Actions to address fish passage in the main stem Middle Fork Willamette River will be contemplated at a future date, beyond 2021, and will be informed by a Configuration and Operations Plan update in FY 2019, the performance of the downstream passage facilities at Cougar and Detroit dams, and through continuing research in this sub basin addressing the uncertainty, feasibility and biological benefit of actions.



APPROPRIATION TITLE: Construction, Environment, Fiscal Year 2018

PROJECT: Mud Mountain Dam, Washington (Continuing)

LOCATION: Mud Mountain Dam is located at river mile 29.6 on the White River, six miles upstream and southeast of Enumclaw, WA, and 38 miles southeast of Tacoma, WA, in western Washington State. When the original flood damage reduction project was built in 1948, a fish passage trap and haul facility was constructed six miles downstream of the Mud Mountain Dam near Buckley, WA, adjacent to a privately owned barrier structure.

DESCRIPTION: The fish collection facility currently collects salmon, including Endangered Species Act (ESA) listed anadromous fish, to be trucked upstream around Mud Mountain Dam. The current facility is deteriorated and unsafe. Chinook salmon, steelhead, and bull trout were listed under the Endangered Species Act (ESA) and are being impacted by the current facility. After the listing, several river basins in the Puget Sound including the White River basin also experienced dramatic and significant increase in pink salmon return numbers (a non-listed species). The significant increase in the volume of fish at the trap and haul facility is further impacting survival of ESA listed species. In October 2014, the National Marine Fisheries Service (NMFS) issued a Biological Opinion (BiOp) that included a reasonable and prudent alternative (RPA) with direction to replace the existing fish trap and barrier structure due in large part to the extreme overcrowding and stress related mortality caused by non-listed fish on ESA listed fish. The new facility would increase the capacity for fish trap and haul thereby reducing impacts to endangered species by separating the thousands of endangered fish from the hundreds of thousands of non-listed fish. The design and execution document and letter report for the proposed new fish passage facility was completed and approved in Fiscal Year (FY) 2015.

AUTHORIZATION: Flood Control Act of 1936, PL 74-738

REMAINING BENEFIT-REMAINING COST RATIO: The remaining benefit-remaining cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

TOTAL BENEFIT-COST RATIO: The total benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

INITIAL BENEFIT-COST RATIO: The initial benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

BASIS OF BENEFIT-COST RATIO: The basis of benefit-cost ratio for the entire project is not applicable because environmental benefits were not quantified in monetary terms.

SUMMARIZED FINANCIAL DATA:		ACCUM PCT OF EST FED COST	STATUS (1 Jan 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Cost	185,085,000		Entire Project	20%	TBD
Estimated Non-Federal Cost	0		Design	35%	TBD
Total Estimated Project Cost	185,085,000		Trap and Haul	0%	TBD
Authorized Cost (plus inflation)	185,085,000		Barrier	0%	TBD
Maximum Cost (Section 902)	N/A				
Allocations to 30 September 2014	10,184,000				
Allocation for FY 2015	5,014,000				
Allocation for FY 2016	10,036,000				
Allocation for FY 2017	16,400,000				
Allocations through FY 2017	41,634,000	1/ 2/ 3/ 5/	22%		
Estimated Unobligated Carry-In Funds	0	4/			
President's Budget for FY 2018	33,600,000		41%		
Programmed Balance to Complete after FY 2018	109,851,000				

1/ \$6,950,142 reprogrammed to the Fish Passage project through 2016.

2/ \$2,000 rescinded from the Fish Passage project.

3/ \$0 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$1,976,000, including \$206,000 of unobligated funds that are committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this effort is \$0.

5/ PED costs of \$0 are included in this amount.

PHYSICAL DATA: Fish Barrier and Trap and Haul Facility Improvements. An existing fish barrier foundation would be used as a platform for constructing a new fish barrier structure with hydraulically actuated gates. An existing fish trap and haul facility would be replaced with a new facility.

JUSTIFICATION: Operation of the Mud Mountain Dam flood damage reduction project includes upstream migratory fish passage that is currently provided at the fish trap and haul facility at Buckley, WA, six miles downstream of Mud Mountain Dam. The trap and haul facility is co-located with a privately owned barrier structure. The trap and haul facility is over 60 years old and the barrier is over a 100 years old. Both features of the fish passage facility are in a severe state of deterioration, are unsafe to operate and do not provide sufficient fish passage to protect current endangered species. In addition to the deteriorated state of the fish passage facility, there has been a dramatic and significant increase in pink salmon (a non-listed species) that are arriving at the fish facility and are additionally impacting the passage of the endangered species. The October 2014 BiOp cites the fish passage facility as a cause of jeopardy for the listed species addressed therein. Replacing the trap and haul facility will minimize injuries to Endangered Species Act (ESA) listed

Division: Northwestern

District: Seattle

Mud Mountain Dam, WA

anadromous fish and is essential to avoid jeopardy and adverse modification of critical habitat for listed species. A letter report was completed and approved in 2015 which outlined basic features of the least cost alternatives to meet ESA requirements.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, will be used as follows:

Complete roads and levees, barrier and fish trap and haul facility design	\$7,556,000
Initiate construction	\$11,820,000
Total	\$18,376,000

FISCAL YEAR 2018: The budgeted amount, plus carry-in funds, will be applied as follows:

Continue construction of the barrier and fish trap and haul facility	\$33,600,000
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NON-FEDERAL COSTS: N/A. Fish trap and haul improvements are a Federal cost.

STATUS OF LOCAL COOPERATION: N/A.

COMPARISON OF FEDERAL COST ESTIMATE: The current estimated Federal cost of \$185,085,000 is same as was reported to the congressional appropriations committees by email dated January 27, 2017.

The following outlines the changes between the initial Design and Execution Document (DED) and Letter Report estimate of \$116.8 million to the current estimate of \$185.1 million. Although the scope did not change and cost saving efforts through value engineering studies resulted in decreased facility size and construction savings, the costs still increased due to the following:

- 1.The current cost reflects a better understanding of the design requirements and construction site environment, as supported by hydraulic modeling, which had not been done in the DED.
- 2.The DED estimate was based on a design with a preliminary understanding of the construction environment. As such, a total of 10 drawing sheets were developed with an estimated construction cost of \$10 million per sheet. Although an initial agency technical review was performed, no certifiable cost estimate was produced.
- 3.At the 30% P & S review, there were approximately 400 design sheets that provided improved understanding of the site conditions and design requirements. With increased understanding of the requirements, increased precision on the costs were realized.
4. In the DED, the contingency used was 42 percent. However typically at that level of design, a standard range of contingency is 30 to 100%. Therefore, the contingency surrounding the preliminary estimate was too low within the DED.

STATUS OF ENVIRONMENTAL IMPACT STATEMENT: An Environmental Assessment (EA) for the Dam Safety Assurance Program was completed in June 1986 with an additional EA and Finding of No Significant Impact (FONSI) was completed in June 1999. An EA and draft FONSI for the replacement of the barrier dam was completed in October 2007. A programmatic Biological Assessment under the ESA for the operations and maintenance of Mud Mountain Dam, as well as the replacement of the barrier dam, was completed in June 2005. An EA for Mud Mountain Dam Upstream Fish Passage was completed in May 2015.

Division: Northwestern

District: Seattle

Mud Mountain Dam, WA

OTHER INFORMATION: Design of the MMD fish passage improvements were initiated when Congress added \$500,000 in FY 2002 for “the design of fish passage facilities.” A BiOp was issued in 2014, and a Letter Report, and Execution Document were completed in FY 2015 which are the basis for the proposed construction.

1 January 2017

Division: Northwestern

District: Seattle

Mud Mountain Dam, WA

APPROPRIATION TITLE: Construction – Flood Risk Management, Fiscal Year 2018

PROJECT: Bluestone Lake, WV Dam Safety Assurance (Continuing)

LOCATION: The dam is located in southern WV, in Summers County, on the New River two miles south of Hinton, WV. It is situated 2.5 miles downstream from the confluence of the New and Bluestone Rivers, and 0.8 miles upstream from the confluence of the New and Greenbrier Rivers.

DESCRIPTION: Per an August 1998 Dam Safety Assurance (DSA) Evaluation Report, the project includes raising the dam eight feet by installing a pre-cast concrete wall, stabilizing the dam with anchors and mass concrete thrust blocks, improving the spillway, modifying six penstocks to increase discharge capacity, and installing scour protection for the modified penstocks. Construction is being accomplished in phases. To date, Phases 1 and 2A & 2B have been completed. The cost of this project is funded at 100 percent Federal expense. All work is programmed.

Phase 1 consisted of construction of a temporary access bridge crossing below the dam, construction of a thrust block, extension of six existing penstocks, and installation of sacrificial bulkheads on three of the six penstocks. This Phase was funded to completion in FY 2000 and physically completed in FY 2004.

Phase 2A included construction of a swing gate closure across Route 20, improvements to the access road on the left side of dam, construction of a fishing pier on the right side, and construction of an additional monolith on the east abutment. Phase 2B consisted of installation of 150 high strength anchors for critical monoliths and installation of the three sacrificial bulkheads on the remaining penstocks. Additional funding from the American Recovery & Reinvestment Act in 2009 increased the number of anchors to be installed in Phase 2B by adding 66 additional anchors (for a Phase 2B total of 216 anchors) and the installation of gallery drains in the dam. This Phase was funded to completion in FY 2005 and physically completed in FY 2011.

Phase 3 includes installation of scour protection and training walls to finish an auxiliary spillway with the existing penstocks. This Phase was funded to completion in FY 2010 and construction was completed in February 2017. Contract close out and as built are expected in August 2017.

Phase 4 includes the installation of approximately 278 high strength anchors across the face of the dam. This Phase was funded to completion in FY 2012 and is expected to physically complete in FY 2019.

A Dam Safety Modification Study (DSMS) is underway to supplement the original 1998 DSA Evaluation Report. The DSMS will evaluate installation of a parapet wall, additional anchors, spillway improvements, or other measures and will result in an updated baseline cost. This DSMS will be risk-informed and will be used to formulate and select the most appropriate actions to further reduce flood risk at beyond the current construction activities. A supplementary Environmental Impact Statement is being prepared concurrently to support the DSMS.

AUTHORIZATION: Section 5 of the Flood Control Act (FCA) of 1936 (P.L. 74-738) as amended by Section 4 of the FCA 1938 (P.L. 75-761) incorporating the Executive Order of the President 7183A, September 12, 1935.

REMAINING BENEFIT – REMAINING COST RATIO: Not applicable because this is a dam safety project

TOTAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

INITIAL BENEFIT – COST RATIO: Not applicable because this is a dam safety project

Division: Great Lakes and Ohio River

District: Huntington

Bluestone Lake Dam Safety Assurance, WV

BASIS OF BENEFIT – COST RATIO: Not applicable because this is a dam safety project

SUMMARIZED FINANCIAL DATA		ACCUM PCT OF EST FED COST	STATUS (15 MAR 2017)	PCT CMPL	PHYSICAL COMPLETION SCHEDULE
Estimated Federal Project Modification Cost	\$555,371,000		Phase 1	100	Apr 2004
Estimated Non-Federal Project Modification Cost	N/A		Phase 2A	100	May 2006
Total Estimated Project Modification Cost	\$555,371,000		Phase 2B	100	Nov 2011
Authorized Cost (plus inflation)	\$500,061,000	6/	Phase 3	100	Feb 2017
			Phase 4	60	TBD
Admin Maximum Cost Limit (Section 902)	\$589,590,000	7/			
			DSMS and EIS	90	August 2017
Allocations through 30 September 2014	\$335,550,000	5/ 8/			
Allocation for FY 2015	\$21,200,000				
Allocation for FY 2016	\$18,000,000				
Allocation for FY 2017	\$4,577,000	4/			
Allocations through FY 2017	\$379,327,000	1/2/3/8/	68		
President's Budget for FY 2018	\$4,425,000		69		
Programmed Balance to Complete after FY 2018	\$171,619,000	8/			
Unprogrammed Balance to Complete after FY 2018	0				

1/ \$28,103,000 reprogrammed from the project, which includes \$13,260,775 of ARRA funds.

2/ \$442,000 rescinded from the project.

3/ \$12,500,000 transferred to the Flood Control and Coastal Emergencies account.

4/ Estimated Unobligated Carry-in Funding: The actual unobligated carry-in from FY 2016 to FY 2017 was \$2,612,997, including \$89,472 committed within the Corps for scheduled ongoing requirements in FY 2017. As of the date this justification sheet was prepared, the total unobligated dollars estimated to be carried into FY 2018 from prior appropriations for use on this project is \$0.

5/ PED costs of \$0 are included in this amount.

6/ Authorized Cost (Approved Cost) is based on the 2011 Letter Report, which was a supplement to the 1998 Dam Safety Evaluation Report.

7/ For Dam Safety projects, this is an administrative equivalent to the Section 902 limit.

8/ An error was discovered in the calculation of the previously reported amount for "Allocations to 30 September 2013" on the J-sheet prepared for the prior FY which reported an amount that was higher than actual allocations received to date. The amount reported above for "Allocations to 30 September 2014" has been adjusted to account for the previous error and is in agreement with USACE financial records. Making this correction also required adjustments to the "Allocations through FY 2017" and "Programmed Balance to Complete after FY 2018" amounts from what would have been expected when comparing to prior J-sheets.

Division: Great Lakes and Ohio River

District: Huntington

Bluestone Lake Dam Safety Assurance, WV

PHYSICAL DATA: Increase height of dam 8 feet; install anchors and thrust blocks; construct gate closure across State Route 20; modify penstocks; address scour potential in spillway to meet necessary discharge capacity; relocate electrical lines.

JUSTIFICATION: Bluestone Lake Dam is a Dam Safety Action Classification (DSAC) 2 project, which is defined by ER 1110-2-1156 as “High Urgency” where failure could begin during normal operations or be initiated by an event; or the incremental risk – combination of life or economic consequences with likelihood of failure – is high. The DSA Program provides for modification of completed Corps dam projects which are potential safety hazards in light of present-day engineering standards. While implementing actions approved in the 1998 DSA report, a 2008 Issues Evaluation study indicated that new failure modes not addressed in the 1998 study warranted further consideration. Specifically, scour of the primary basin was identified as a potential risk to dam failure and life risk. A 2013 Baseline Condition Risk Assessment confirmed that there is sufficient justification to study further modifying the project to address additional significant risk associated with scour of the primary basin and directed completion of a DSMS and accelerating approved work through Phase 4. This DSMS, which utilizes a risk-informed approach to identify the most appropriate actions to reduce incremental risks not addressed by the 1998 DSA study, will provide a more definitive cost and schedule to achieve life-safety risk reduction goals. It has been determined that there is a 1.4 to 0.05% annual probability that Bluestone Dam will reach a pool that threatens the dam’s stability, the Imminent Failure Flood (IFF) elevation. The Mapping, Modeling and Consequence Center provided updated inundation data in late FY 2012. This revised data indicated a failure would cause catastrophic flooding along the Greenbrier, New, Gauley, Kanawha, and Elk Rivers and at the heavily industrialized state capital of Charleston, WV, putting 174,000 people at risk with property damages in excess of \$21,000,000,000.

FISCAL YEAR 2017: The appropriated amount, plus carry-in funds, are being applied as follows:

Continue Phases 3&4 E&D and Construction Management	\$ 4,000,000
Complete Dam Safety Modification Study and Environmental Impact Statement	2,523,525
Total	\$ 6,523,525

FISCAL YEAR 2018: The budget amount, plus carry-in funds, will be applied as follows:

Complete Phase 3 Fiscal Close-out and Continue Phase 4 E&D and Construction Management	\$ 4,425,000
Total	\$ 4,425,000

NON-FEDERAL COST: None. The DSA modification is being performed at full Federal expense.

COMPARISON OF FEDERAL COST ESTIMATES: The current Federal cost estimate of \$555,371,000 is an increase of \$28,057,000 from the latest estimate presented to Congress (FY 2017). The \$555,371,000 estimate is the fully funded estimate based on the certified total project cost estimate that was certified on April 28, 2016 and included all phases and future work from the approved 1998 report. This change includes the following items:

Price Escalation on Construction Features (cost increases due to contract modifications and impacted E&D and S&A from time extensions)	\$ 11,500,000
Post Contract Award and Other Estimating Adjustments (including contingency adjustments)	16,657,000
Total	\$28,057,000

STATUS OF ENVIRONMENTAL IMPACT STATEMENT COMPLIANCE: The final Environmental Impact Statement was filed with EPA on August 31, 1998. A supplementary Environmental Impact Statement is being prepared for the DSMS.

OTHER INFORMATION: The Bluestone Dam, WV, Final DSA Evaluation Report and Environmental Impact Statement were approved August 13, 1998. Funds to initiate construction were appropriated in FY 2000. An amendment to the Evaluation Report in the form of a Letter Report was completed in 2004 to address project cost estimate changes due to differing site conditions. In response to the Issue Evaluation Study (IES) risk assessment, Congressional / state / local briefings were held in November 2008 and emergency exercises were performed in December 2008 and January 2009, with state and local entities participating. Local leadership briefings and public meetings were held in all counties. A functional emergency exercise was conducted July 2011 with Federal, state, and local entities, and the Huntington District serving as the central command center. The state of West Virginia continues to develop statewide emergency exercise initiatives.

