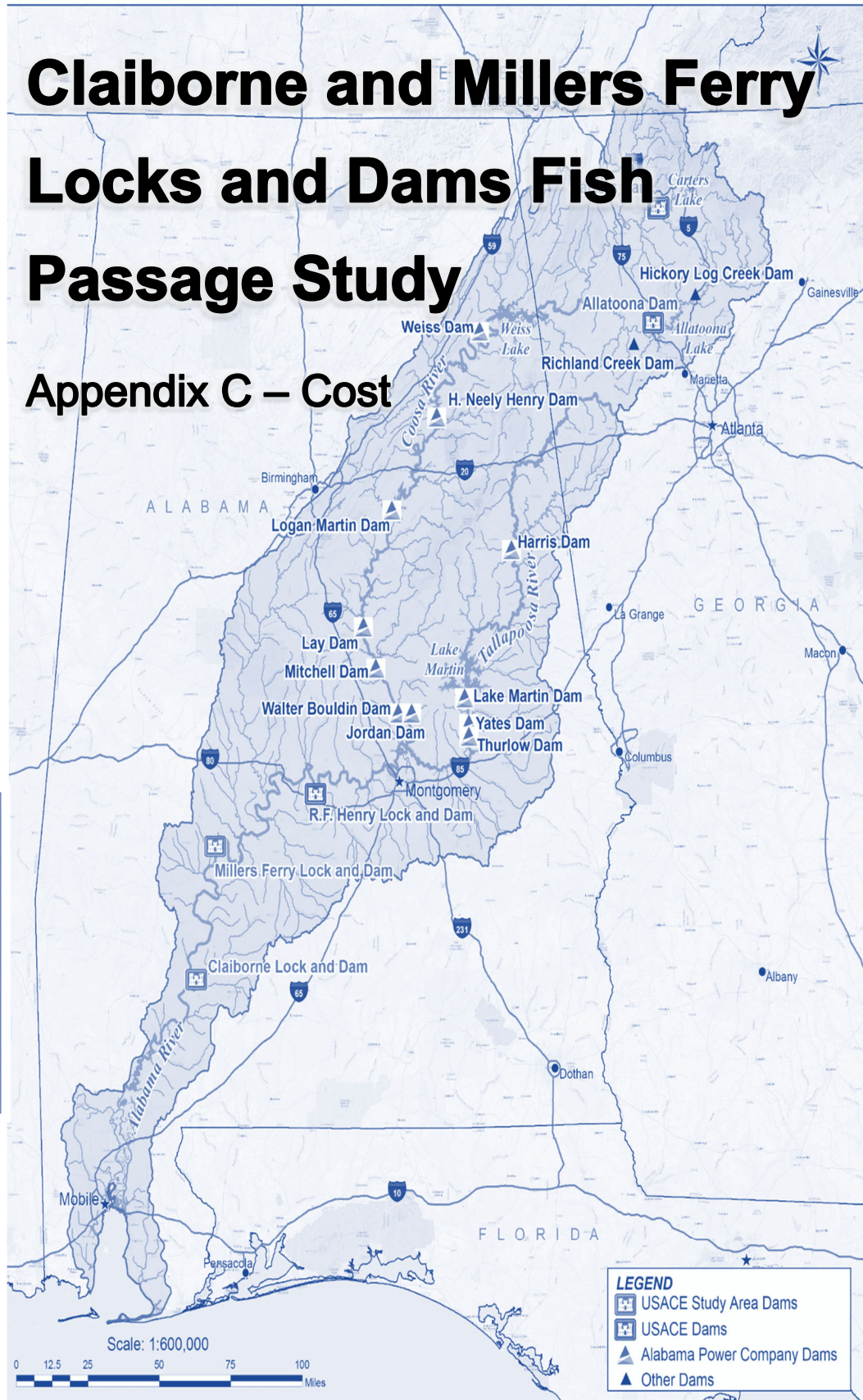




# Claiborne and Millers Ferry Locks and Dams Fish Passage Study

## Appendix C – Cost



US Army Corps of Engineers®



## APPENDIX-C: Cost

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## C.1. Introduction

### C.1.1. Study Area

Claiborne and Millers Ferry Locks and Dams are part of the Alabama-Coosa-Tallapoosa (ACT) River system. The ACT is an interconnected river system and drainage basin that extends from southeast Tennessee and the northwest corner of Georgia through Alabama and discharges at Mobile Bay in southwest Alabama. The system contains 5 U.S. Army Corps of Engineers (USACE) dams and 11 privately owned dams as shown on Figure C1.

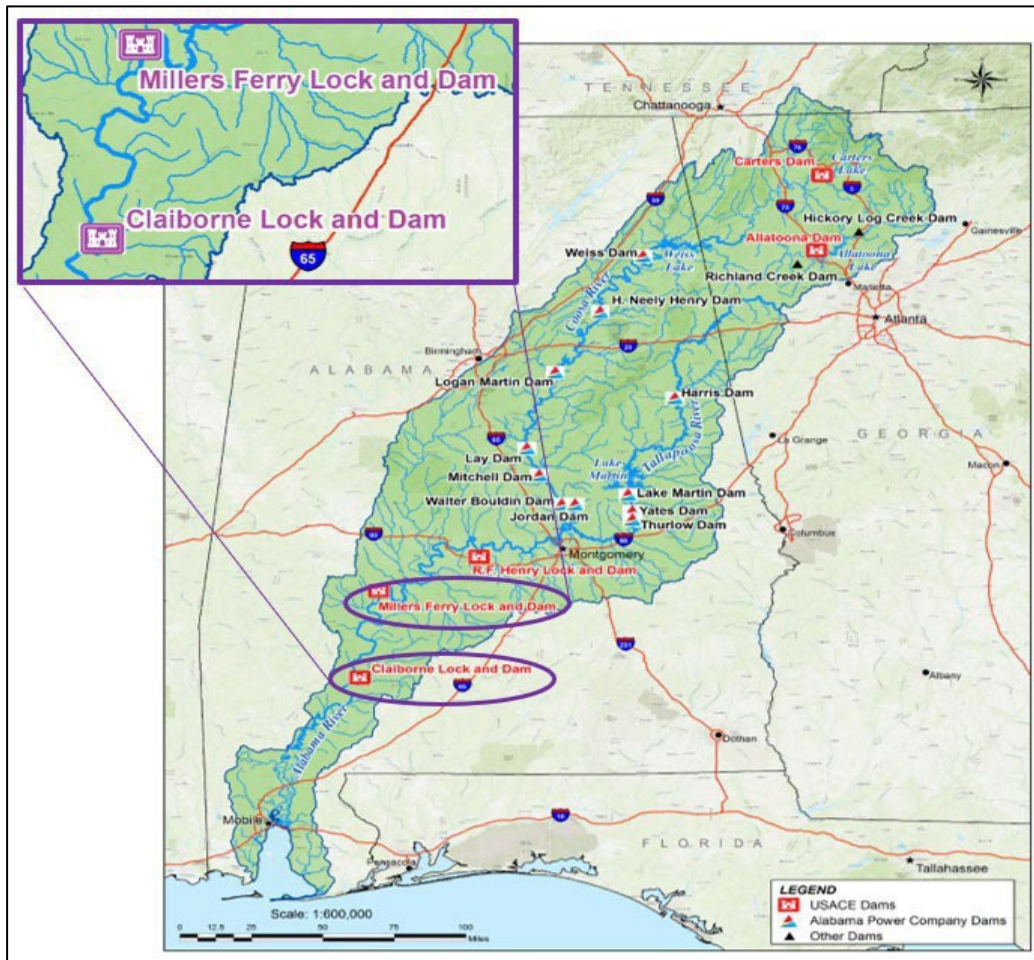


Figure C1: The Alabama-Coosa-Tallapoosa (ACT) River system

### C.1.2. Purpose

The purpose of the study is to evaluate Federal interest in establishing fish passage through restoring connectivity in the Alabama and Cahaba Rivers. The system is highly impaired by two dams which restrict access to historical spawning grounds on the Cahaba River from species present in the lower Alabama River. This disruption of natural fish migration patterns has resulted in a decline in native aquatic species populations. Passage would reconnect over 230 miles of the Alabama and Cahaba Rivers to the Mobile River Delta into the Gulf of Mexico, providing connectivity for multiple species of

fish, crawfish, mussels, turtles, etc. These species are extremely important to this freshwater ecosystem and are critical to sustain biodiversity and encourage a healthy ecosystem. This system provides one of the last habitats to many affected species and increased access to historical spawning grounds should result in an increase in the size and distribution of native fish populations.

## **C.2. Development and Description of Alternatives**

### ***C.2.1. Development of Alternatives***

Many alternatives and measures were developed and screened out prior to development of any reliable cost estimates. The initial array of alternatives presented at the Alternatives Milestone Meeting (AMM) included 20 measures as presented in Table C-1 along with the screening status. These alternatives were screened on factors other than cost, so a complete description of the measures and explanation of the screening is available in other parts of this report.

Table C-1: Initial Array of Alternatives

<b>Alternatives</b>	<b>Screened out / Carried Forward</b>
<b>Alt. 1: No Action Alternative</b>	Carried Forward
<b>Alt. 2: Dam Removal- Both CL and MF</b>	Carried Forward
<b>Alt. 3: Fixed Weir Rock Arch- Both CL and MF</b>	Carried Forward
<b>Alt. 4: Fish Lift- Both CL and MF</b>	Screened Out
<b>Alt. 5: Natural Bypass Channel- Both CL and MF</b>	Carried Forward
<b>Alt. 6: Partial Dam Removal- Both CL and MF</b>	Carried Forward
<b>Alt. 7: Dam Removal- CL; Fixed Weir Rock Arch- MF</b>	Carried Forward
<b>Alt. 8: Dam Removal- CL; Fish Lift- MF</b>	Screened Out
<b>Alt. 9: Dam Removal- CL Bypass Channel- MF</b>	Carried Forward
<b>Alt. 10: Dam Removal- CL; Partial Dam Removal- MF</b>	Carried Forward
<b>Alt. 11: Fixed Weir Rock Arch- CL; Fish Lift- MF</b>	Screened Out
<b>Alt. 12: Bypass- CL; Fixed Weir Arch- MF</b>	Carried Forward
<b>Alt. 13: Bypass- CL; Fish Lift- MF</b>	Screened Out
<b>Alt. 14: Fish Lift- CL; Fixed Wei Rock Arch- MF</b>	Screened Out
<b>Alt. 15: Partial Dam Removal- CL; Fixed Weir Rock Arch- MF</b>	Screened Out
<b>Alt. 16: Partial Dam Removal- CL; Fish Lift- MF</b>	Screened Out
<b>Alt 17: Partial Dam Removal- CL; Natural Bypass- MF</b>	Carried Forward
<b>Alt. 18: No Structural Change- CL; Fixed Weir Rock Arch- MF</b>	Screened Out
<b>Alt. 19: No Structural Change- CL; Fish Lift- MF</b>	Screened Out
<b>Alt. 20: No Structural Change- CL; Natural Bypass- MF</b>	Screened Out

The focused array of alternatives, including site specific options, was developed before the AMM. The focused array of alternatives includes ten structural and/or combination alternatives. The complete list is included in Table C-2.

*Table C-2: Focused Array of Alternatives*

<b>Focused Array of Alternatives</b>	<b>Screened Out / Carried Forward</b>
<b>Alt. 1: No Action Alternative</b>	Carried Forward
<b>Alt. 2: Dam Removal- Both CL and MF</b>	Carried Forward
<b>Alt. 3: Fixed Weir Rock Arch- Both CL and MF</b>	Carried Forward
<b>Alt. 5: Natural Bypass Channel- Both CL and MF</b>	Carried Forward
<b>Alt. 6: Partial Dam Removal- Both CL and MF</b>	Carried Forward
<b>Alt. 7: Dam Removal- CL; Fixed Weir Rock Arch- MF</b>	Carried Forward
<b>Alt. 9: Dam Removal- CL Bypass Channel- MF</b>	Carried Forward
<b>Alt. 10: Dam Removal- CL; Partial Dam Removal- MF</b>	Carried Forward
<b>Alt. 12: Bypass- CL; Fixed Weir Arch- MF</b>	Carried Forward
<b>Alt. 17: Partial Dam Removal- CL; Natural Bypass- MF</b>	Carried Forward

### ***C.2.2. Screening of Focused Array***

This array of alternatives was analyzed based on environmental benefits achieved, and incremental cost analyses of those benefits. Dam removal was screened out due to violations of study-specific constraints and high overall systemwide impacts. Dam removal would end hydropower generation, a current project authorized purpose at Millers Ferry resulting in a substantial loss in annual benefits. Dam removal would result in negative systemwide environmental impacts including invasive species migration, dredging requirements, contaminated sediment, and unmet flow requirements. All alternatives with that option were removed resulting in the Final Array of Alternatives.

## **C.3. Development of Alternative Estimates for Final Array**

### ***C.3.1. Price Level***

The total estimated cost for each of the final alternatives consists of the estimated construction cost, the real estate cost, the Planning, Engineering and Design (PED) cost, the Construction Management (CM) cost, and a contingency developed using an Abbreviated Risk Analysis (ARA). Each estimate is a class 4 level estimate per ER 1110-2-1302.

### ***C.3.2. Cost Estimate Structure***

The cost estimate was developed using a collaboration of several components. Each measure was estimated as a separate project and combined to make alternatives shown in Table C-2. Specifically, the Claiborne Bypass Channel and Rock Weir Arch were each estimated separately from the Millers Ferry Bypass Channel and Rock Weir Arch in MCACES 2<sup>nd</sup> generation software (MII). In the ARA and Total Project Cost Summaries (TPCS) the measures were combined using simple addition. This approach is justified due to the geographical separation of the project sites. There are no anticipated economies of scale applicable to the alternatives that would need to be included in these estimates.

The construction cost estimates were prepared using MII. Prices used in developing the construction estimates have been found in the 2023 MII Cost Book and material pricing has been validated by requesting quotes from local suppliers. The MII equipment library was set to the 2022 Region III Equipment Library which captures equipment rates in the southeast United States. These rates were backchecked and modified as required to reflect accurate equipment pricing from recent historical projects in Alabama. Labor rates were modified per Davis-Bacon wage rates in Monroe and Wilcox counties Alabama. Project markups were included in the MII estimate as appropriate. PED and CM costs were developed using typical rates from previous Civil Works studies completed by Mobile District. Rates were validated by the project development team and changes were made as necessary to reflect accurate PED and CM costs. An ARA was conducted for each of the study alternatives to provide a basis for carrying contingency forward. These contingency rates were included in the TPCS. Real estate costs and their respective contingency and administrative costs were provided by real estate division and included for each alternative.

### ***C.3.3. Risk Analysis and Contingency***

For the analysis an ARA was prepared for each alternative. The ARAs were prepared with input from the PDT to quantify the risks and assigning likelihood and impact of each risk. Existing geotechnical data was not sufficient to develop conceptual design and cost estimates which result in a medium risk. ARA results are included in the Cost Exhibit C-1.

### ***C.3.4. Cost Estimate Presentation***

A TPCS was prepared for each alternative. The TPCS combines the RE costs, construction costs, Contingency, PED, and CM, and applies escalation factors to calculate a total project cost for each alternative. Table C-3 shows the Total Project Costs, estimated operations and maintenance (O&M) costs, and estimated construction durations for each of the final array of alternatives. O&M costs are at FY2025 Price level to facilitate economic analysis.

*Table C-3: Total Project Costs and Durations of Final Array*

<b>Alternative</b>	<b>Total Project Cost</b>	<b>Annual O&amp;M (FY25)</b>	<b>Construction Duration</b>
<b>Alt. 1: No Action Alternative</b>	\$0	\$0	0 Months
<b>Alt. 3: Fixed Weir Rock Arch- Both CL and MF</b>	\$227,300,000	\$200,000	24 Months
<b>Alt. 5d: Natural Bypass Channel- Both Dams (CL right bank, MF right bank)</b>	\$189,700,000	\$200,000	30 Months
<b>Alt. 12b: Fixed Weir Rock Arch- CL; Natural Bypass Channel- MF</b>	\$202,800,000	\$200,000	30 Months
<b>Alt. 13b: Natural Bypass Channel (CL right bank); Fixed Weir Rock Arch- MF</b>	\$213,900,000	\$200,000	24 Months

#### **C.3.5. Development of Operations and Maintenance Costs**

Operations and maintenance costs of the final array of alternatives, although not a part of the TPCS, are used in the economics analysis. The O&M costs for the alternatives include routine maintenance costs for the planned gates at Millers Ferry, additional Water Management monitoring, and removal of debris and shoaling at fish passage sites. The O&M cost estimates may be seen in table C-3. O&M costs were estimated using FY25 Price Level.

#### **C.4. Development of the Estimated Schedule**

The estimated construction durations have been developed based on the anticipated project requirements from “notice to proceed” through construction completion. The projected project construction durations may be seen in table C-3.

#### **C.5. Selection of the Recommended Plan**

Based on the analysis considering project objectives, environmental outcomes, P&G criteria, Cost Effectiveness Analysis (CE), and the Multi-Criteria Decision Analysis (MCDA), the tentatively selected plan (TSP) is Alternative 5d – Natural Bypass Channel at both Claiborne and Millers Ferry Locks and Dams. Alternative 5d has the lowest cost and highest ecological lift of all final array alternatives, is the only best buy action alternative and has the highest comprehensive score from the MCDA. This alternative provides connectivity to the Cahaba River while providing the most acceptable method of fish passage. Sixteen Federally listed threatened and endangered species benefit equally or more with alternative 5d than any other alternative evaluated. Additionally, alternative 5d is preferred by the non-Federal sponsor. The TSP becomes the Recommended Plan once endorsed at the Agency Decision Milestone.

## **C.6. Development of the Recommended Plan Estimate**

After confirmation of the Recommended Plan, additional analysis and design was performed to refine design details and assumptions. Significant changes were made in the layout of the Miller's Ferry Dam bypass channel to address public comments and avoid privately held lands. Additionally, during a semi-qualitative risk assessment (SQRA) investigating potential failure modes related to the Recommended Plan, significant erosion protection needs were identified at Claiborne dam between the bypass channel and the river. These changes were incorporated into the estimate along with refinements to structural designs and foundation requirements.

### **C.6.1 MII Estimate**

The estimate was developed using the Microcomputer Aided Cost Estimating System, Second Generation (MII) as required by section 10 of ER 1110-2-1302. MII estimates and files contain sensitive cost and pricing data, are generally not releasable, and are not included in this appendix. Copies are available under limited circumstances upon request to the PDT.

### **C.6.2 Cost and Schedule Risk Analysis**

To develop contingency amounts for the TPCS, the PDT conducted a detailed risk analysis as described in ER 1110-2-1302 on the recommended plan. This detailed risk analysis included risk identification, quantitative and qualitative study, and sensitivity analysis using a Monte Carlo simulation method. The risk analysis contains a report detailing the process, discussions, key concerns, justification for the contingencies calculated, and risk mitigation plans. The report is only releasable as prescribed in ER 1110-2-1302, however the cost and schedule risk registers are presented as Exhibit C-4: CSRA Risk Register

### **C.6.3 Total Project Cost Summary (TPCS) Sheet**

The TPCS for the recommended plan were prepared in accordance with ER 1110-2-1302 and includes PED, CM, Real Estate, and construction estimates along with contingency amounts and escalation to the mid-point of each feature of work. Escalation was calculated by application of Civil Works Construction Cost Index System (CWCCIS) escalation factors from EM 1110-2-1304 that are incorporated into the TPCS sheet template.

The TPCS summary and details are included as an Exhibit at the end of this appendix. The estimated first cost for the Recommended Plan is \$222 million and the estimated Total Project Cost is \$279 million. The first cost is at FY2025 price levels and the Total Project cost is reported with the escalation to the midpoint of each feature.

### **C.6.4 Implementation Schedule**

A conceptual schedule was developed based on the MII estimate and application of multiple crews throughout. The schedule assumes that a single construction contract will be awarded and that the sites can be constructed concurrently.

The General Schedule is as follows:

- Claiborne:
  - Dry Island Armoring and upstream cofferdam first.
  - Construction of upstream access starts with beginning of excavation (to allow for access to fishing locations)
  - Excavation will be from the upstream side to the downstream side
  - Downstream cofferdam will be installed close to when needed
  - Downstream channel exit
  - Removal of downstream Cofferdam
  - Removal of upstream cofferdam
  
- Miller's Ferry:
  - Construction will begin at Gate to allow for earthen cofferdam upstream of gate location
  - Construction will generally be from the inside out to the channel tie-ins
  - Gate Construction
  - Cofferdam construction
  - Excavation will be from multiple locations along the upstream side to the downstream side
  - Removal of downstream Cofferdam
  - Removal of upstream cofferdam
  - All other activities are expected to be run concurrent with the gate construction or excavation.
  
- Schedule Results are that:
  - Construction of MF will take 38 Months with a midpoint in Second Quarter (Q2) FY2032
  - Construction of CL will take 34 Months with a midpoint in Q2 FY2032
  - PED will take 30 months with a midpoint in Q2 FY2029
  - Total duration is 71 Months
  - Midpoint of Adaptive Management and Monitoring is 5 years after completion of construction, Q2 FY2038

## **C.7. Operations and Maintenance Costs**

O&M is estimated at \$356,000 per year for the RP. The non-federal sponsor will be responsible for all O&M costs during the life of the project except those associated with the gate at the Millers Ferry Dam site. O&M cost is excluded from the TPCS, but is included in the economic analysis. O&M activities that occur less frequently than annually have had their costs annualized.

Anticipated O&M activities include:

- Gate Maintenance
- Gate Painting
- Gate Cathodic Protection Preventative Maintenance
- Gate Cathodic Protection Replacement

- Gate Operator Maintenance
- Water Management monitoring for Gate operation
- Gate Stop log inspection
- Gate replacement
- Clearing of debris and shoaling within the bypass channel
- Herbicide application along the bypass channel

### **C.8. Exhibits**

- 1) Exhibit C-1: Abbreviated Risk Analysis for the Final Array of Alternatives
- 2) Exhibit C-2: TPCS Sheets for the Final Array of Alternatives
- 3) Exhibit C-3: Conceptual Schedule for Recommended Plan
- 4) Exhibit C-4: CSRA Risk Register
- 5) Exhibit C-5: TPCS Sheet for Recommended Plan

Claiborne and Millers Ferry Lock and Dams Fish Passage Study  
Appendix C

Exhibit C-1: Abbreviated Risk Analysis for the Final Array of Alternatives

**Abbreviated Risk Analysis**

Project (less than \$40M): **Claiborne and Millers Ferry Locks and Dams Fish Passage St**  
 Project Development Stage/Alternative: **Feasibility (Alternatives)**  
 Risk Category: **Moderate Risk: Typical Project Construction Type**

Alternative: **Alt 3**

Meeting Date: **12/9/2022**

Total Estimated Construction Contract Cost = \$ **109,981,527**

	<u>CWWBS</u>	<u>Feature of Work</u>	<u>Estimated Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate	\$ 170,000	32%	\$ 55,000	\$ 225,000
1	06 01 FISH FACILITIES AT DAMS	CL Excavation	\$ 2,857,420	46.4%	\$ 1,327,160	\$ 4,184,580
2	06 01 FISH FACILITIES AT DAMS	CL Conc Installation	\$ 13,507,769	42.7%	\$ 5,772,470	\$ 19,280,239
3	06 01 FISH FACILITIES AT DAMS	CL Cofferdam	\$ 4,239,012	58.7%	\$ 2,489,144	\$ 6,728,156
4	06 01 FISH FACILITIES AT DAMS	CL Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509
5	06 01 FISH FACILITIES AT DAMS	MF Excavation	\$ 59,236,347	46.4%	\$ 27,512,966	\$ 86,749,313
6	06 01 FISH FACILITIES AT DAMS	MF Conc Installation	\$ 14,608,963	42.7%	\$ 6,243,059	\$ 20,852,022
7	06 01 FISH FACILITIES AT DAMS	MF Cofferdam	\$ 3,651,787	58.7%	\$ 2,144,326	\$ 5,796,113.21
8	06 01 FISH FACILITIES AT DAMS	MF Gate Structure (Rock Arch)	\$ 512,953	40.4%	\$ 207,386	\$ 720,339.45
9	06 01 FISH FACILITIES AT DAMS	MF Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509.09
10			\$ -	0%	\$ -	\$ -
11			\$ -	0%	\$ -	\$ -
12	All Other	Remaining Construction Items	\$ -	0.0%	\$ -	\$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 10,335,100	24.7%	\$ 2,548,915	\$ 12,884,015
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 5,820,000	24.8%	\$ 1,443,104	\$ 7,263,104
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				\$ -	\$ -

<b>Totals</b>					
	Real Estate	\$ 170,000	32%	\$ 55,000	\$ 225,000.10
	Total Construction Estimate	\$ 109,981,527	46%	\$ 50,554,254	\$ 160,535,781
	Total Planning, Engineering & Design	\$ 10,335,100	25%	\$ 2,548,915	\$ 12,884,015
	Total Construction Management	\$ 5,820,000	25%	\$ 1,443,104	\$ 7,263,104
	<b>Total Excluding Real Estate</b>	<b>\$ 126,136,627</b>	<b>43%</b>	<b>\$ 54,546,273</b>	<b>\$ 180,682,900</b>

Confidence Level	Range Estimate (\$000's)		
	Base	50%	80%
	\$126,137k	\$158,865k	\$180,683k

\* 50% based on base is at 5% CL

<p><b>Fixed Dollar Risk Add:</b> (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.)</p>	
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**Abbreviated Risk Analysis**

Project (less than \$40M): **Claiborne and Millers Ferry Locks and Dams Fish Passage**  
 Project Development Stage/Alternative: **Feasibility (Alternatives)**  
 Risk Category: **Moderate Risk: Typical Project Construction Type**

**Alternative: Alt 5**

**Meeting Date: 12/9/2022**

Total Estimated Construction Contract Cost = \$ **84,090,635**

	<u>CWWBS</u>	<u>Feature of Work</u>	<u>Estimated Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate	\$ 660	25.0%	\$ 165	\$ 825
1	06 01 FISH FACILITIES AT DAMS	CL Excavation	\$ 6,699,901	46.4%	\$ 3,111,842	\$ 9,811,743
2	06 01 FISH FACILITIES AT DAMS	CL Cofferdam	\$ 735,825	58.7%	\$ 432,076	\$ 1,167,901
3	06 01 FISH FACILITIES AT DAMS	CL Rock Lining and Weirs	\$ 5,772,540	47.5%	\$ 2,739,707	\$ 8,512,247
4	06 01 FISH FACILITIES AT DAMS	CL Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509
5	06 01 FISH FACILITIES AT DAMS	MF Excavation	\$ 27,284,862	46.4%	\$ 12,672,751	\$ 39,957,613
6	06 01 FISH FACILITIES AT DAMS	MF Cofferdam	\$ 1,055,794	58.7%	\$ 619,961	\$ 1,675,755
7	06 01 FISH FACILITIES AT DAMS	MF Rock Lining and Weirs	\$ 23,882,959	47.5%	\$ 11,335,097	\$ 35,218,055.57
8	06 01 FISH FACILITIES AT DAMS	MF Gate Structure (Bypass)	\$ 1,607,839	52.0%	\$ 836,484	\$ 2,444,323.19
9	06 01 FISH FACILITIES AT DAMS	MF Prefab Bridge	\$ 11,367,276	42.7%	\$ 4,857,742	\$ 16,225,018.18
10			\$ -	0.0%	\$ -	\$ -
11			\$ -	0.0%	\$ -	\$ -
12	All Other	Remaining Construction Items	\$ 1	0.0%	\$ 0	\$ 1
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 16,312,750	24.7%	\$ 4,023,165	\$ 20,335,915
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 8,830,000	27.8%	\$ 2,454,911	\$ 11,284,911
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				\$ -	

<b>Totals</b>					
	Real Estate	\$ 660	25%	\$ 165	\$ 825.00
	Total Construction Estimate	\$ 84,090,635	46%	\$ 39,034,531	\$ 123,125,166
	Total Planning, Engineering & Design	\$ 16,312,750	25%	\$ 4,023,165	\$ 20,335,915
	Total Construction Management	\$ 8,830,000	28%	\$ 2,454,911	\$ 11,284,911
	Total Excluding Real Estate	\$ 109,233,385	42%	\$ 45,512,607	\$ 154,745,992

Confidence Level Range Estimate (\$000's)	Base	50%	80%
		\$109,233k	\$136,541k

\* 50% based on base is at 5% CL

**Fixed Dollar Risk Add:** (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.)

**Abbreviated Risk Analysis**

Project (less than \$40M): **Claiborne and Millers Ferry Locks and Dams Fish Passage**  
 Project Development Stage/Alternative: **Feasibility (Alternatives)**  
 Risk Category: **Moderate Risk: Typical Project Construction Type**

**Alternative: Alt 12b**

**Meeting Date: 12/9/2022**

Total Estimated Construction Contract Cost = \$ **91,486,569**

	<u>CWWBS</u>	<u>Feature of Work</u>	<u>Estimated Cost</u>	<u>% Contingency</u>	<u>\$ Contingency</u>	<u>Total</u>
	01 LANDS AND DAMAGES	Real Estate	\$ 620,000	25.0%	\$ 155,000	\$ 775,000
1	06 01 FISH FACILITIES AT DAMS	CL Excavation	\$ 2,857,420	46.4%	\$ 1,327,160	\$ 4,184,580
2	06 01 FISH FACILITIES AT DAMS	CL Conc Installation	\$ 13,507,769	42.7%	\$ 5,772,470	\$ 19,280,239
3	06 01 FISH FACILITIES AT DAMS	CL Cofferdam	\$ 4,239,012	58.7%	\$ 2,489,144	\$ 6,728,156
4	06 01 FISH FACILITIES AT DAMS	CL Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509
5	06 01 FISH FACILITIES AT DAMS	MF Excavation	\$ 27,284,862	46.4%	\$ 12,672,751	\$ 39,957,613
6	06 01 FISH FACILITIES AT DAMS	MF Cofferdam	\$ 1,055,794	58.7%	\$ 619,961	\$ 1,675,755
7	06 01 FISH FACILITIES AT DAMS	MF Rock Lining and Weirs	\$ 23,882,959	47.5%	\$ 11,335,097	\$ 35,218,055.57
8	06 01 FISH FACILITIES AT DAMS	MF Gate Structure (Bypass)	\$ 1,607,839	52.0%	\$ 836,484	\$ 2,444,323.19
9	06 01 FISH FACILITIES AT DAMS	MF Prefab Bridge	\$ 11,367,276	42.7%	\$ 4,857,742	\$ 16,225,018.18
10			\$ -	0%	\$ -	\$ -
11			\$ -	0%	\$ -	\$ -
12	All Other	Remaining Construction Items	\$ -	0.0%	\$ -	\$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 15,885,400	24.7%	\$ 3,917,769	\$ 19,803,169
14	31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 9,606,000	24.8%	\$ 2,381,866	\$ 11,987,866
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)				\$ -	\$ -

<b>Totals</b>						
	Real Estate	\$	620,000	25%	\$	775,000.00
	Total Construction Estimate	\$	91,486,569	46%	\$	133,826,250
	Total Planning, Engineering & Design	\$	15,885,400	25%	\$	19,803,169
	Total Construction Management	\$	9,606,000	25%	\$	11,987,866
	Total Excluding Real Estate	\$	116,977,969	42%	\$	165,617,285

Confidence Level Range Estimate (\$000's)	Base	50%	80%
		\$116,978k	\$146,161k

\* 50% based on base is at 5% CL

**Fixed Dollar Risk Add:** (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.)

**Abbreviated Risk Analysis**

Project (less than \$40M): **Claiborne and Millers Ferry Locks and Dams Fish Passage**  
 Project Development Stage/Alternative: **Feasibility (Alternatives)**  
 Risk Category: **Moderate Risk: Typical Project Construction Type**

Alternative: **Alt 13b**

Meeting Date: **12/9/2022**

Total Estimated Construction Contract Cost = \$ **102,585,593**

CWWBS	Feature of Work	Estimated Cost	% Contingency	\$ Contingency	Total
01 LANDS AND DAMAGES	Real Estate	\$ 230,000	26.1%	\$ 60,000	\$ 290,000
1 06 01 FISH FACILITIES AT DAMS	CL Excavation	\$ 6,699,901	46.4%	\$ 3,111,842	\$ 9,811,743
2 06 01 FISH FACILITIES AT DAMS	CL Cofferdam	\$ 735,825	58.7%	\$ 432,076	\$ 1,167,901
3 06 01 FISH FACILITIES AT DAMS	CL Rock Lining and Weirs	\$ 5,772,540	47.5%	\$ 2,739,707	\$ 8,512,247
4 06 01 FISH FACILITIES AT DAMS	CL Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509
5 06 01 FISH FACILITIES AT DAMS	MF Excavation	\$ 59,236,347	46.4%	\$ 27,512,966	\$ 86,749,313
6 06 01 FISH FACILITIES AT DAMS	MF Conc Installation	\$ 14,608,963	42.7%	\$ 6,243,059	\$ 20,852,022
7 06 01 FISH FACILITIES AT DAMS	MF Cofferdam	\$ 3,651,787	58.7%	\$ 2,144,326	\$ 5,796,113.21
8 06 01 FISH FACILITIES AT DAMS	MF Gate Structure (Rock Arch)	\$ 512,953	40.4%	\$ 207,386	\$ 720,339.45
9 06 01 FISH FACILITIES AT DAMS	MF Prefab Bridge	\$ 5,683,638	42.7%	\$ 2,428,871	\$ 8,112,509.09
10		\$ -	0.0%	\$ -	\$ -
11		\$ -	0.0%	\$ -	\$ -
12 All Other	Remaining Construction Items	\$ 1	0.0%	\$ 0	\$ 1
13 30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	\$ 10,762,450	24.7%	\$ 2,654,311	\$ 13,416,761
14 31 CONSTRUCTION MANAGEMENT	Construction Management	\$ 5,043,000	24.8%	\$ 1,250,442	\$ 6,293,442
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)			\$ -	

Totals					
	Real Estate	\$ 230,000	26%	\$ 60,000	\$ 290,000.10
	Total Construction Estimate	\$ 102,585,593	46%	\$ 47,249,104	\$ 149,834,697
	Total Planning, Engineering & Design	\$ 10,762,450	25%	\$ 2,654,311	\$ 13,416,761
	Total Construction Management	\$ 5,043,000	25%	\$ 1,250,442	\$ 6,293,442
	Total Excluding Real Estate	\$ 118,391,043	43%	\$ 51,153,858	\$ 169,544,901
			Base	50%	80%
	Confidence Level Range Estimate (\$000's)		\$118,391k	\$149,083k	\$169,545k

\* 50% based on base is at 5% CL

**Fixed Dollar Risk Add:** (Allows for additional risk to be added to the risk analysis. Must include justification. Does not allocate to Real Estate.)

Claiborne and Millers Ferry Lock and Dams Fish Passage Study  
Appendix C

Exhibit C-2: TPCS Sheets for the Final Array of Alternatives

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
PROJECT NO: Alt 3 Rock Arch Both Dams  
LOCATION: Monroe and Wilcox Counties, AI

DISTRICT: Mobile District  
POC: CHIEF, COST ENGINEERING, George Brown  
PREPARED: 1/31/2031

This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Spent Thru: 1-Oct-22 (\$K)	TOTAL FIRST COST (\$K)	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
06	Excavation	\$62,093	\$28,811	46.4%	\$90,904	5.5%	\$65,528	\$30,405	\$95,933	\$0	\$95,933	15.2%	\$75,480	\$35,023	\$110,503
06	Concrete Installation	\$28,117	\$12,006	42.7%	\$40,123	5.5%	\$29,673	\$12,670	\$42,343	\$0	\$42,343	15.2%	\$34,179	\$14,594	\$48,773
06	Cofferdam	\$7,891	\$4,632	58.7%	\$12,523	5.5%	\$8,328	\$4,888	\$13,216	\$0	\$13,216	15.2%	\$9,592	\$5,631	\$15,223
06	Prefab Bridge	\$11,368	\$4,854	42.7%	\$16,222	5.5%	\$11,997	\$5,123	\$17,120	\$0	\$17,120	15.2%	\$13,819	\$5,901	\$19,720
06	Gate Structure	\$513	\$207	40.4%	\$720	5.5%	\$541	\$219	\$760	\$0	\$760	15.2%	\$624	\$252	\$876
06	Rock Armoring & Weirs	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#/N/A	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#/N/A	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$109,982	\$50,511		\$160,493	5.5%	\$116,067	\$53,305	\$169,372	\$0	\$169,372	15.2%	\$133,693	\$61,400	\$195,094
01	LANDS AND DAMAGES	\$170	\$55	32.4%	\$225	5.5%	\$179	\$58	\$237	\$0	\$237	8.0%	\$194	\$63	\$256
30	PLANNING, ENGINEERING & DESIGN	\$10,335	\$2,553	24.7%	\$12,888	5.1%	\$10,861	\$2,683	\$13,544	\$0	\$13,544	9.3%	\$11,869	\$2,932	\$14,800
31	CONSTRUCTION MANAGEMENT	\$11,548	\$2,864	24.8%	\$14,412	5.1%	\$12,136	\$3,010	\$15,146	\$0	\$15,146	12.7%	\$13,679	\$3,392	\$17,071
<b>PROJECT COST TOTALS:</b>		\$132,035	\$55,982	42.4%	\$188,017		\$139,243	\$59,055	\$198,298	\$0	\$198,298	14.6%	\$159,435	\$67,787	\$227,222

CHIEF, COST ENGINEERING, George Brown

ESTIMATED TOTAL PROJECT COST: \$227,222

PROJECT MANAGER, Jonas White

CHIEF, REAL ESTATE, Karen Kennedy

CHIEF, PLANNING, Jenny Jacobson

CHIEF, ENGINEERING, Jason Krick

CHIEF, OPERATIONS, Nelson Sanchez

CHIEF, CONSTRUCTION, George Condoyiannis

CHIEF, CONTRACTING, Jeff Burgess

CHIEF, PM-PB, xxxx

CHIEF, DPM, Pete Taylor

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, Al  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 1/31/2031

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>31-Jan-23</b>		Program Year (Budget EC): 2025		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24						
		RISK BASED												
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL
NUMBER	Feature & Sub-Feature Description	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	Date	(%)	(\$K)	(\$K)	(\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Claiborne</b>													
	Excavation	\$2,857	\$1,326	46.4%	\$4,183	5.5%	\$3,015	\$1,399	\$4,414	2030Q3	15.2%	\$3,473	\$1,611	\$5,084
<b>06</b>	Concrete Installation	\$13,508	\$5,768	42.7%	\$19,276	5.5%	\$14,255	\$6,087	\$20,342	2030Q3	15.2%	\$16,420	\$7,011	\$23,432
<b>06</b>	Cofferdam	\$4,239	\$2,488	58.7%	\$6,727	5.5%	\$4,474	\$2,626	\$7,099	2030Q3	15.2%	\$5,153	\$3,025	\$8,178
<b>06</b>	Prefab Bridge	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q3	15.2%	\$6,909	\$2,950	\$9,860
<b>06</b>	Gate Structure	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$26,288	\$12,009	45.7%	\$38,297		\$27,742	\$12,673	\$40,416			\$31,956	\$14,598	\$46,554
<b>01</b>	LANDS AND DAMAGES	\$90	\$35	38.9%	\$125	5.5%	\$95	\$37	\$132	2028Q1	8.0%	\$103	\$40	\$143
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Planning & Environmental Compliance	\$1,275	\$315	24.7%	\$1,590	5.1%	\$1,340	\$331	\$1,671	2028Q1	6.7%	\$1,430	\$353	\$1,783
0.0%	Engineering & Design	\$6,100	\$1,507	24.7%	\$7,607	5.1%	\$6,410	\$1,583	\$7,994	2028Q1	6.7%	\$6,843	\$1,690	\$8,533
0.0%	Reviews, ATRs, IEPs, VE	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Life Cycle Updates (cost, schedule, risks)	\$120	\$30	24.7%	\$150	5.1%	\$126	\$31	\$157	2028Q1	6.7%	\$135	\$33	\$168
0.0%	Contracting & Reprographics	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2028Q1	6.7%	\$112	\$28	\$140
0.0%	Engineering During Construction	\$200	\$49	24.7%	\$249	5.1%	\$210	\$52	\$262	2030Q3	12.7%	\$237	\$59	\$296
0.0%	Planning During Construction	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2030Q3	12.7%	\$118	\$29	\$147
0.0%	Adaptive Management & Monitoring	\$1,800	\$445	24.7%	\$2,245	5.1%	\$1,892	\$467	\$2,359	2033Q3	20.3%	\$2,275	\$562	\$2,837
0.0%	Project Operations	\$40	\$10	24.7%	\$50	5.1%	\$42	\$10	\$52	2028Q1	6.7%	\$45	\$11	\$56
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$2,366	\$587	24.8%	\$2,953	5.1%	\$2,486	\$617	\$3,103	2030Q3	12.7%	\$2,802	\$695	\$3,497
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$394	\$98	24.8%	\$492	5.1%	\$414	\$103	\$517	2030Q3	12.7%	\$467	\$116	\$583
	<b>CONTRACT COST TOTALS:</b>	\$39,473	\$15,281		\$54,754		\$41,599	\$16,112	\$57,711			\$47,196	\$18,380	\$65,577

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, Al  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 1/31/2031

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>31-Jan-23</b>		Program Year (Budget EC): 2025										
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Millers Ferry</b>													
	Excavation	\$59,236	\$27,486	46.4%	\$86,722	5.5%	\$62,513	\$29,006	\$91,519	2030Q3	15.2%	\$72,007	\$33,411	\$105,418
<b>06</b>	Concrete Installation	\$14,609	\$6,238	42.7%	\$20,847	5.5%	\$15,417	\$6,583	\$22,000	2030Q3	15.2%	\$17,759	\$7,583	\$25,342
<b>06</b>	Cofferdam	\$3,652	\$2,144	58.7%	\$5,796	5.5%	\$3,854	\$2,262	\$6,116	2030Q3	15.2%	\$4,439	\$2,606	\$7,045
<b>06</b>	Prefab Bridge	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q3	15.2%	\$6,909	\$2,950	\$9,860
<b>06</b>	Gate Structure	\$513	\$207	40.4%	\$720	5.5%	\$541	\$219	\$760	2030Q3	15.2%	\$624	\$252	\$876
<b>06</b>	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$83,694	\$38,502	46.0%	\$122,196		\$88,324	\$40,632	\$128,956			\$101,738	\$46,802	\$148,540
<b>01</b>	LANDS AND DAMAGES	\$80	\$20	25.0%	\$100	5.5%	\$84	\$21	\$106	2028Q1	8.0%	\$91	\$23	\$114
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning & Environmental Compliance	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering & Design	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Reviews, ATRs, IEPs, VE	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Contracting & Reprographics	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Adaptive Management & Monitoring	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operations	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$7,532	\$1,868	24.8%	\$9,401	5.1%	\$7,916	\$1,963	\$9,879	2030Q3	12.7%	\$8,922	\$2,213	\$11,135
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$1,255	\$311	24.8%	\$1,567	5.1%	\$1,319	\$327	\$1,646	2030Q3	12.7%	\$1,487	\$369	\$1,856
<b>CONTRACT COST TOTALS:</b>		\$92,562	\$40,701		\$133,263		\$97,644	\$42,943	\$140,587			\$112,238	\$49,407	\$161,645

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
PROJECT NO: Alt 5 Bypass Both Dams  
LOCATION: Monroe and Wilcox Counties, Al

DISTRICT: Mobile District  
POC: CHIEF, COST ENGINEERING, George Brown  
PREPARED: 12/13/2022

This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Program Year (Budget EC): 2025 Effective Price Level Date: 1 OCT 24		TOTAL FIRST COST (\$K)	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										Spent Thru: 1-Oct-22 (\$K)						
A	B	C	D	E	F	G	H	I	J		K		L	M	N	O
06	Excavation	\$33,985	\$15,769	46.4%	\$49,754	5.5%	\$35,865	\$16,641	\$52,507	\$0	\$52,507	15.9%	\$41,580	\$19,293	\$60,873	
06	Concrete Installation	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
06	Cofferdam	\$1,792	\$1,052	58.7%	\$2,844	5.5%	\$1,891	\$1,110	\$3,001	\$0	\$3,001	15.9%	\$2,192	\$1,287	\$3,479	
06	Prefab Bridge	\$17,051	\$7,281	42.7%	\$24,332	5.5%	\$17,994	\$7,684	\$25,678	\$0	\$25,678	15.9%	\$20,861	\$8,908	\$29,769	
06	Gate Structure	\$1,608	\$836	52.0%	\$2,444	5.5%	\$1,697	\$882	\$2,579	\$0	\$2,579	15.9%	\$1,967	\$1,023	\$2,990	
06	Rock Armoring & Weirs	\$29,656	\$14,087	47.5%	\$43,743	5.5%	\$31,297	\$14,866	\$46,163	\$0	\$46,163	15.9%	\$36,283	\$17,235	\$53,518	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$84,092	\$39,024		\$123,116	5.5%	\$88,744	\$41,184	\$129,928	\$0	\$129,928	15.9%	\$102,884	\$47,745	\$150,630	
01	LANDS AND DAMAGES	\$660	\$165	25.0%	\$825	5.5%	\$697	\$174	\$871	\$0	\$871	8.0%	\$752	\$188	\$940	
30	PLANNING, ENGINEERING & DESIGN	\$16,313	\$4,029	24.7%	\$20,342	5.1%	\$17,143	\$4,234	\$21,378	\$0	\$21,378	8.4%	\$18,577	\$4,588	\$23,165	
31	CONSTRUCTION MANAGEMENT	\$8,830	\$2,455	27.8%	\$11,284	5.1%	\$9,275	\$2,580	\$11,859	\$0	\$11,859	13.3%	\$10,516	\$2,923	\$13,440	
<b>PROJECT COST TOTALS:</b>		\$109,895	\$45,673	41.6%	\$155,568		\$115,863	\$48,172	\$164,035	\$0	\$164,035	14.7%	\$132,729	\$55,445	\$188,174	

CHIEF, COST ENGINEERING, George Brown

ESTIMATED TOTAL PROJECT COST: \$188,175

PROJECT MANAGER, Jonas White

CHIEF, REAL ESTATE, Karen Kennedy

CHIEF, PLANNING, Jenny Jacobson

CHIEF, ENGINEERING, Jason Krick

CHIEF, OPERATIONS, Nelson Sanchez

CHIEF, CONSTRUCTION, George Condoyiannis

CHIEF, CONTRACTING, Jeff Burgess

CHIEF, PM-PB, xxxx

CHIEF, DPM, Pete Taylor

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, AL  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 12/13/2022

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)					
		Estimate Prepared: <b>8-Dec-22</b>		Program Year (Budget EC): 2025											
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24											
		RISK BASED													
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL	
NUMBER	Feature & Sub-Feature Description	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	Date	(%)	(\$K)	(\$K)	(\$K)	
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O	
<b>06</b>	<b>Claiborne</b>	\$6,700	\$3,109	46.4%	\$9,809	5.5%	\$7,071	\$3,281	\$10,351	2030Q4	15.9%	\$8,197	\$3,804	\$12,001	
<b>06</b>	Excavation	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
<b>06</b>	Concrete Installation	\$736	\$432	58.7%	\$1,168	5.5%	\$777	\$456	\$1,233	2030Q4	15.9%	\$900	\$529	\$1,429	
<b>06</b>	Cofferdam	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q4	15.9%	\$6,954	\$2,969	\$9,924	
<b>06</b>	Prefab Bridge	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
<b>06</b>	Gate Structure	\$5,773	\$2,742	47.5%	\$8,515	5.5%	\$6,092	\$2,894	\$8,986	2030Q4	15.9%	\$7,063	\$3,355	\$10,418	
	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$18,893	\$8,710	46.1%	\$27,603		\$19,938	\$9,192	\$29,130			\$23,115	\$10,657	\$33,772	
<b>01</b>	LANDS AND DAMAGES	\$660	\$165	25.0%	\$825	5.5%	\$697	\$174	\$871	2028Q1	8.0%	\$752	\$188	\$940	
<b>30</b>	PLANNING, ENGINEERING & DESIGN														
0.0%	Project Management	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420	
0.0%	Planning & Environmental Compliance	\$7,253	\$1,791	24.7%	\$9,044	5.1%	\$7,622	\$1,883	\$9,505	2028Q1	6.7%	\$8,136	\$2,010	\$10,146	
0.0%	Engineering & Design	\$6,100	\$1,507	24.7%	\$7,607	5.1%	\$6,410	\$1,583	\$7,994	2028Q1	6.7%	\$6,843	\$1,690	\$8,533	
0.0%	Reviews, ATRs, IEPRs, VE	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420	
0.0%	Life Cycle Updates (cost, schedule, risks)	\$120	\$30	24.7%	\$150	5.1%	\$126	\$31	\$157	2028Q1	6.7%	\$135	\$33	\$168	
0.0%	Contracting & Reprographics	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2028Q1	6.7%	\$112	\$28	\$140	
0.0%	Engineering During Construction	\$200	\$49	24.7%	\$249	5.1%	\$210	\$52	\$262	2030Q4	13.3%	\$238	\$59	\$297	
0.0%	Planning During Construction	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2030Q4	13.3%	\$119	\$29	\$149	
0.0%	Adaptive Management & Monitoring	\$1,800	\$445	24.7%	\$2,245	5.1%	\$1,892	\$467	\$2,359	2033Q3	20.3%	\$2,275	\$562	\$2,837	
0.0%	Project Operations	\$40	\$10	24.7%	\$50	5.1%	\$42	\$10	\$52	2028Q1	6.7%	\$45	\$11	\$56	
<b>31</b>	CONSTRUCTION MANAGEMENT														
9.0%	Construction Management	\$1,700	\$473	27.8%	\$2,173	5.1%	\$1,787	\$497	\$2,284	2030Q4	13.3%	\$2,025	\$563	\$2,588	
0.0%	Project Operation:	\$0	\$0	27.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
1.5%	Project Management	\$283	\$79	27.8%	\$362	5.1%	\$298	\$83	\$381	2030Q4	13.3%	\$338	\$94	\$431	
	<b>CONTRACT COST TOTALS:</b>	\$37,850	\$13,456		\$51,306		\$39,863	\$14,180	\$54,043			\$44,807	\$16,090	\$60,897	

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, Al  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 12/13/2022

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>8-Dec-22</b>		Program Year (Budget EC): 2025										
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Millers Ferry</b>													
	Excavation	\$27,285	\$12,660	46.4%	\$39,945	5.5%	\$28,795	\$13,361	\$42,155	2030Q4	15.9%	\$33,382	\$15,489	\$48,872
<b>06</b>	Concrete Installation	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Cofferdam	\$1,056	\$620	58.7%	\$1,676	5.5%	\$1,114	\$654	\$1,769	2030Q4	15.9%	\$1,292	\$758	\$2,050
<b>06</b>	Prefab Bridge	\$11,367	\$4,854	42.7%	\$16,221	5.5%	\$11,996	\$5,122	\$17,118	2030Q4	15.9%	\$13,907	\$5,938	\$19,845
<b>06</b>	Gate Structure	\$1,608	\$836	52.0%	\$2,444	5.5%	\$1,697	\$882	\$2,579	2030Q4	15.9%	\$1,967	\$1,023	\$2,990
<b>06</b>	Rock Armoring & Weirs	\$23,883	\$11,344	47.5%	\$35,227	5.5%	\$25,204	\$11,972	\$37,176	2030Q4	15.9%	\$29,220	\$13,880	\$43,100
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$65,199	\$30,314	46.5%	\$95,513		\$68,806	\$31,992	\$100,798			\$79,769	\$37,089	\$116,858
<b>01</b>	LANDS AND DAMAGES	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning & Environmental Compliance	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering & Design	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Reviews, ATRs, IEPRs, VE	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Contracting & Reprographics	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Adaptive Management & Monitoring	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operations	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$5,868	\$1,631	27.8%	\$7,499	5.1%	\$6,167	\$1,714	\$7,881	2030Q4	13.3%	\$6,989	\$1,943	\$8,932
0.0%	Project Operation:	\$0	\$0	27.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$978	\$272	27.8%	\$1,250	5.1%	\$1,028	\$286	\$1,313	2030Q4	13.3%	\$1,165	\$324	\$1,489
<b>CONTRACT COST TOTALS:</b>		\$72,045	\$32,218		\$104,262		\$76,000	\$33,992	\$109,992			\$87,923	\$39,355	\$127,278



\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
LOCATION: Monroe and Wilcox Counties, AI  
This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 12/13/2022

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>8-Dec-22</b>		Program Year (Budget EC): 2025										
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24										
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Claiborne</b>	\$2,857	\$1,326	46.4%	\$4,183	5.5%	\$3,015	\$1,399	\$4,414	2030Q4	15.9%	\$3,495	\$1,622	\$5,117
<b>06</b>	Excavation	\$13,508	\$5,768	42.7%	\$19,276	5.5%	\$14,255	\$6,087	\$20,342	2030Q4	15.9%	\$16,527	\$7,057	\$23,584
<b>06</b>	Concrete Installation	\$4,239	\$2,488	58.7%	\$6,727	5.5%	\$4,474	\$2,626	\$7,099	2030Q4	15.9%	\$5,186	\$3,044	\$8,230
<b>06</b>	Cofferdam	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q4	15.9%	\$6,954	\$2,969	\$9,923
<b>06</b>	Prefab Bridge	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Gate Structure	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$26,288	\$12,009	45.7%	\$38,297		\$27,742	\$12,673	\$40,416			\$32,163	\$14,693	\$46,856
<b>01</b>	LANDS AND DAMAGES	\$90	\$23	25.0%	\$113	5.5%	\$95	\$24	\$119	2028Q1	8.0%	\$103	\$26	\$129
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Planning & Environmental Compliance	\$6,825	\$1,686	24.7%	\$8,511	5.1%	\$7,172	\$1,772	\$8,944	2028Q1	6.7%	\$7,656	\$1,891	\$9,547
0.0%	Engineering & Design	\$6,100	\$1,507	24.7%	\$7,607	5.1%	\$6,410	\$1,583	\$7,994	2028Q1	6.7%	\$6,843	\$1,690	\$8,533
0.0%	Reviews, ATRs, IEPRs, VE	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Life Cycle Updates (cost, schedule, risks)	\$120	\$30	24.7%	\$150	5.1%	\$126	\$31	\$157	2028Q1	6.7%	\$135	\$33	\$168
0.0%	Contracting & Reprographics	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2028Q1	6.7%	\$112	\$28	\$140
0.0%	Engineering During Construction	\$200	\$49	24.7%	\$249	5.1%	\$210	\$52	\$262	2030Q4	13.3%	\$238	\$59	\$297
0.0%	Planning During Construction	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2030Q4	13.3%	\$119	\$29	\$148
0.0%	Adaptive Management & Monitoring	\$1,800	\$445	24.7%	\$2,245	5.1%	\$1,892	\$467	\$2,359	2033Q3	20.3%	\$2,275	\$562	\$2,837
0.0%	Project Operations	\$40	\$10	24.7%	\$50	5.1%	\$42	\$10	\$52	2028Q1	6.7%	\$45	\$11	\$56
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$2,366	\$587	24.8%	\$2,953	5.1%	\$2,486	\$617	\$3,103	2030Q4	13.3%	\$2,818	\$695	\$3,513
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$394	\$98	24.8%	\$492	5.1%	\$414	\$103	\$517	2030Q4	13.3%	\$470	\$116	\$586
	<b>CONTRACT COST TOTALS:</b>	\$45,023	\$16,640		\$61,663		\$47,432	\$17,540	\$64,971			\$53,649	\$20,003	\$73,653

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, Al  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 12/13/2022

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>8-Dec-22</b>		Program Year (Budget EC): 2025										
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Millers Ferry</b>													
	Excavation	\$27,285	\$12,660	46.4%	\$39,945	5.5%	\$28,795	\$13,361	\$42,155	2030Q4	15.9%	\$33,382	\$15,489	\$48,872
	Concrete Installation	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	Cofferdam	\$1,056	\$620	58.7%	\$1,676	5.5%	\$1,114	\$654	\$1,769	2030Q4	15.9%	\$1,292	\$758	\$2,050
	Prefab Bridge	\$11,367	\$4,854	42.7%	\$16,221	5.5%	\$11,996	\$5,122	\$17,118	2030Q4	15.9%	\$13,907	\$5,938	\$19,846
	Gate Structure	\$1,608	\$836	52.0%	\$2,444	5.5%	\$1,697	\$882	\$2,579	2030Q4	15.9%	\$1,967	\$1,023	\$2,990
	Rock Armoring & Weirs	\$23,883	\$11,344	47.5%	\$35,227	5.5%	\$25,204	\$11,972	\$37,176	2030Q4	15.9%	\$29,220	\$13,880	\$43,100
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$65,199	\$30,314	46.5%	\$95,513		\$68,806	\$31,992	\$100,798			\$79,769	\$37,089	\$116,858
<b>01</b>	<b>LANDS AND DAMAGES</b>	\$530	\$133	25.0%	\$663	5.5%	\$559	\$140	\$699	2028Q1	8.0%	\$604	\$151	\$755
<b>30</b>	<b>PLANNING, ENGINEERING &amp; DESIGN</b>													
0.0%	Project Management	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning & Environmental Compliance	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering & Design	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Reviews, ATRs, IEPRs, VE	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Contracting & Reprographics	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Adaptive Management & Monitoring	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operations	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>31</b>	<b>CONSTRUCTION MANAGEMENT</b>													
9.0%	Construction Management	\$5,868	\$1,455	24.8%	\$7,323	5.1%	\$6,167	\$1,529	\$7,696	2030Q4	13.3%	\$6,989	\$1,733	\$8,722
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$978	\$243	24.8%	\$1,221	5.1%	\$1,028	\$255	\$1,283	2030Q4	13.3%	\$1,165	\$289	\$1,454
	<b>CONTRACT COST TOTALS:</b>	\$72,575	\$32,145		\$104,720		\$76,560	\$33,916	\$110,475			\$88,527	\$39,262	\$127,789

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

**PROJECT:** Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
**PROJECT NO:** Alt 13b CL Bypass, MF Rock Arch  
**LOCATION:** Monroe and Wilcox Counties, Al

**DISTRICT:** Mobile District  
**POC:** CHIEF, COST ENGINEERING, George Brown

**PREPARED:** 1/31/2023

This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Spent Thru: 1-Oct-22 (\$K)	TOTAL FIRST COST (\$K)	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
06	Excavation	\$65,936	\$30,594	46.4%	\$96,530	5.5%	\$69,584	\$32,287	\$101,871	\$0	\$101,871	15.2%	\$80,151	\$37,190	\$117,342
06	Concrete Installation	\$14,609	\$6,238	42.7%	\$20,847	5.5%	\$15,417	\$6,583	\$22,000	\$0	\$22,000	15.2%	\$17,759	\$7,583	\$25,342
06	Cofferdam	\$4,388	\$2,576	58.7%	\$6,964	5.5%	\$4,631	\$2,718	\$7,349	\$0	\$7,349	15.2%	\$5,334	\$3,131	\$8,465
06	Prefab Bridge	\$11,368	\$4,854	42.7%	\$16,222	5.5%	\$11,997	\$5,123	\$17,120	\$0	\$17,120	15.2%	\$13,819	\$5,901	\$19,720
06	Gate Structure	\$513	\$207	40.4%	\$720	5.5%	\$541	\$219	\$760	\$0	\$760	15.2%	\$624	\$252	\$876
06	Rock Armoring & Weirs	\$5,773	\$2,742	47.5%	\$8,515	5.5%	\$6,092	\$2,894	\$8,986	\$0	\$8,986	15.2%	\$7,018	\$3,333	\$10,351
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$102,587	\$47,212		\$149,799	5.5%	\$108,263	\$49,824	\$158,086	\$0	\$158,086	15.2%	\$124,704	\$57,390	\$182,094
01	LANDS AND DAMAGES	\$230	\$60	26.1%	\$290	5.5%	\$243	\$63	\$306	\$0	\$306	8.0%	\$262	\$68	\$331
30	PLANNING, ENGINEERING & DESIGN	\$10,762	\$2,658	24.7%	\$13,420	5.1%	\$11,310	\$2,794	\$14,103	\$0	\$14,103	9.2%	\$12,348	\$3,050	\$15,398
31	CONSTRUCTION MANAGEMENT	\$10,772	\$2,671	24.8%	\$13,443	5.1%	\$11,320	\$2,807	\$14,127	\$0	\$14,127	12.7%	\$12,759	\$3,164	\$15,923
<b>PROJECT COST TOTALS:</b>		\$124,351	\$52,601	42.3%	\$176,952		\$131,135	\$55,488	\$186,623	\$0	\$186,623	14.5%	\$150,073	\$63,673	\$213,746

CHIEF, COST ENGINEERING, George Brown

ESTIMATED TOTAL PROJECT COST: **\$213,746**

PROJECT MANAGER, Jonas White

CHIEF, REAL ESTATE, Karen Kennedy

CHIEF, PLANNING, Jenny Jacobson

CHIEF, ENGINEERING, Jason Krick

CHIEF, OPERATIONS, Nelson Sanchez

CHIEF, CONSTRUCTION, George Condoyiannis

CHIEF, CONTRACTING, Jeff Burgess

CHIEF, PM-PB, xxxx

CHIEF, DPM, Pete Taylor

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, AL  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 1/31/2023

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>31-Jan-23</b>		Program Year (Budget EC): 2025		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24						
		RISK BASED												
WBS	Civil Works	COST	CNTG	CNTG	TOTAL	ESC	COST	CNTG	TOTAL	Mid-Point	INFLATED	COST	CNTG	FULL
NUMBER	Feature & Sub-Feature Description	(\$K)	(\$K)	(%)	(\$K)	(%)	(\$K)	(\$K)	(\$K)	Date	(%)	(\$K)	(\$K)	(\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Claiborne</b>	\$6,700	\$3,109	46.4%	\$9,809	5.5%	\$7,071	\$3,281	\$10,351	2030Q3	15.2%	\$8,144	\$3,779	\$11,924
<b>06</b>	Excavation	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Concrete Installation	\$736	\$432	58.7%	\$1,168	5.5%	\$777	\$456	\$1,233	2030Q3	15.2%	\$895	\$525	\$1,420
<b>06</b>	Cofferdam	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q3	15.2%	\$6,909	\$2,950	\$9,860
<b>06</b>	Prefab Bridge	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>06</b>	Gate Structure	\$5,773	\$2,742	47.5%	\$8,515	5.5%	\$6,092	\$2,894	\$8,986	2030Q3	15.2%	\$7,018	\$3,333	\$10,351
	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$18,893	\$8,710	46.1%	\$27,603		\$19,938	\$9,192	\$29,130			\$22,966	\$10,588	\$33,554
<b>01</b>	LANDS AND DAMAGES	\$150	\$40	26.7%	\$190	5.5%	\$158	\$42	\$201	2028Q1	8.0%	\$171	\$46	\$217
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Planning & Environmental Compliance	\$1,702	\$420	24.7%	\$2,122	5.1%	\$1,789	\$442	\$2,230	2028Q1	6.7%	\$1,909	\$472	\$2,381
0.0%	Engineering & Design	\$6,100	\$1,507	24.7%	\$7,607	5.1%	\$6,410	\$1,583	\$7,994	2028Q1	6.7%	\$6,843	\$1,690	\$8,533
0.0%	Reviews, ATRs, IEPRs, VE	\$300	\$74	24.7%	\$374	5.1%	\$315	\$78	\$393	2028Q1	6.7%	\$337	\$83	\$420
0.0%	Life Cycle Updates (cost, schedule, risks)	\$120	\$30	24.7%	\$150	5.1%	\$126	\$31	\$157	2028Q1	6.7%	\$135	\$33	\$168
0.0%	Contracting & Reprographics	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2028Q1	6.7%	\$112	\$28	\$140
0.0%	Engineering During Construction	\$200	\$49	24.7%	\$249	5.1%	\$210	\$52	\$262	2030Q3	12.7%	\$237	\$59	\$296
0.0%	Planning During Construction	\$100	\$25	24.7%	\$125	5.1%	\$105	\$26	\$131	2030Q3	12.7%	\$118	\$29	\$147
0.0%	Adaptive Management & Monitoring	\$1,800	\$445	24.7%	\$2,245	5.1%	\$1,892	\$467	\$2,359	2033Q3	20.3%	\$2,275	\$562	\$2,837
0.0%	Project Operations	\$40	\$10	24.7%	\$50	5.1%	\$42	\$10	\$52	2028Q1	6.7%	\$45	\$11	\$56
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$1,700	\$422	24.8%	\$2,122	5.1%	\$1,787	\$443	\$2,230	2030Q3	12.7%	\$2,014	\$499	\$2,514
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$283	\$70	24.8%	\$354	5.1%	\$298	\$74	\$372	2030Q3	12.7%	\$336	\$83	\$419
	<b>CONTRACT COST TOTALS:</b>	\$31,789	\$11,900		\$43,689		\$33,491	\$12,545	\$46,036			\$37,835	\$14,266	\$52,101

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 LOCATION: Monroe and Wilcox Counties, AI  
 This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 1/31/2023

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)					
		Estimate Prepared: <b>31-Jan-23</b>		Program Year (Budget EC): 2025											
		Effective Price Level: 1-Oct-22		Effective Price Level Date: 1 OCT 24											
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)	
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O	
<b>06</b>	<b>Millers Ferry</b>														
	Excavation	\$59,236	\$27,486	46.4%	\$86,722	5.5%	\$62,513	\$29,006	\$91,519	2030Q3	15.2%	\$72,007	\$33,411	\$105,418	
<b>06</b>	Concrete Installation	\$14,609	\$6,238	42.7%	\$20,847	5.5%	\$15,417	\$6,583	\$22,000	2030Q3	15.2%	\$17,759	\$7,583	\$25,342	
<b>06</b>	Cofferdam	\$3,652	\$2,144	58.7%	\$5,796	5.5%	\$3,854	\$2,262	\$6,116	2030Q3	15.2%	\$4,439	\$2,606	\$7,045	
<b>06</b>	Prefab Bridge	\$5,684	\$2,427	42.7%	\$8,111	5.5%	\$5,998	\$2,561	\$8,560	2030Q3	15.2%	\$6,909	\$2,950	\$9,860	
<b>06</b>	Gate Structure	\$513	\$207	40.4%	\$720	5.5%	\$541	\$219	\$760	2030Q3	15.2%	\$624	\$252	\$876	
<b>06</b>	Rock Armoring & Weirs	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$83,694	\$38,502	46.0%	\$122,196		\$88,324	\$40,632	\$128,956			\$101,738	\$46,802	\$148,540	
<b>01</b>	LANDS AND DAMAGES	\$80	\$20	25.0%	\$100	5.5%	\$84	\$21	\$106	2028Q1	8.0%	\$91	\$23	\$114	
<b>30</b>	PLANNING, ENGINEERING & DESIGN														
0.0%	Project Management	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Planning & Environmental Compliance	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Engineering & Design	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Reviews, ATRs, IEPRs, VE	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Contracting & Reprographics	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Engineering During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Planning During Construction	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Adaptive Management & Monitoring	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
0.0%	Project Operations	\$0	\$0	24.7%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
<b>31</b>	CONSTRUCTION MANAGEMENT														
9.0%	Construction Management	\$7,532	\$1,868	24.8%	\$9,401	5.1%	\$7,916	\$1,963	\$9,879	2030Q3	12.7%	\$8,922	\$2,213	\$11,135	
0.0%	Project Operation:	\$0	\$0	24.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0	
1.5%	Project Management	\$1,255	\$311	24.8%	\$1,567	5.1%	\$1,319	\$327	\$1,646	2030Q3	12.7%	\$1,487	\$369	\$1,856	
<b>CONTRACT COST TOTALS:</b>		\$92,562	\$40,701		\$133,263		\$97,644	\$42,943	\$140,587			\$112,238	\$49,407	\$161,645	

Claiborne and Millers Ferry Lock and Dams Fish Passage Study  
Appendix C

Exhibit C-3: Conceptual Schedule for Recommended Plan



Claiborne and Millers Ferry Lock and Dams Fish Passage Study  
Appendix C

Exhibit C-4: CSRA Risk Register



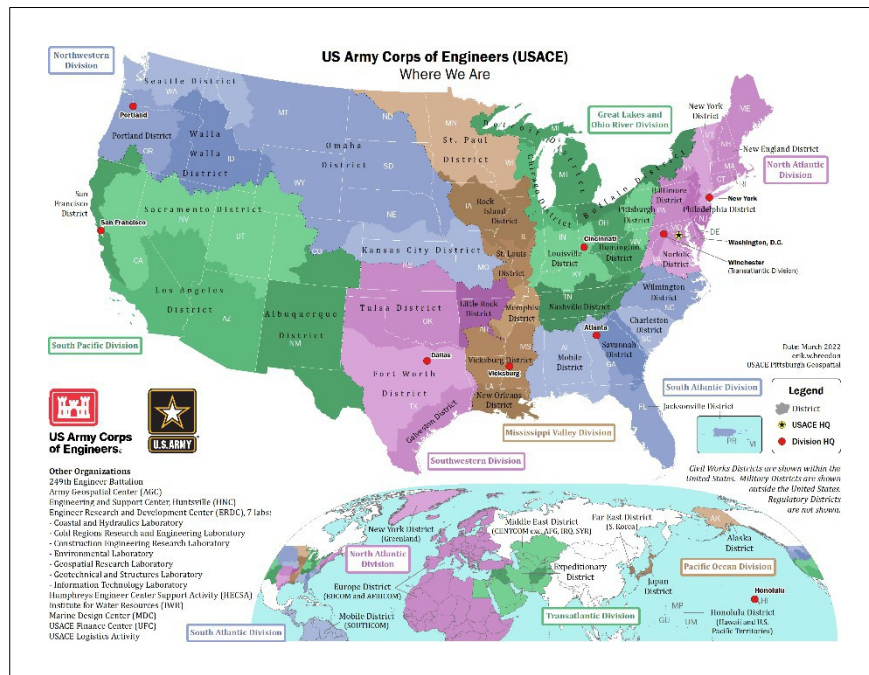
US Army Corps of Engineers

Prepared for:
U.S. Army Corps of Engineers
Mobile District

Claiborne and Millers Ferry Locks and Dams Fish Passage Study

Monroe and Wilcox Counties, Alabama

CSRA for Integrated Feasibility Report and Environmental Assessment



Prepared by:
USACE Mobile District, Cost Engineering Section

December 2023

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# Appendixes

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- Appendix A: Base Estimate
- Appendix B: Base Schedule
- Appendix C: Cost & Schedule Risk Analysis Details

# 1. Purpose

---

The U.S. Army Corps of Engineers (USACE), Mobile District, presents this Cost and Schedule Risk Analysis (CSRA) report regarding the risk findings and recommended contingencies for the Claiborne and Millers Ferry Locks and Dams Fish Passage Study Integrated Feasibility Report and Environmental Assessment. A *Monte-Carlo* based risk analysis was conducted by the Project Development Team (PDT) on remaining costs in compliance with Engineer Regulation (ER) 1110-2-1302, CIVIL WORKS COST ENGINEERING. The purpose of this risk analysis study is to present the cost and schedule risks considered and respective project contingencies at a recommended 80% confidence level of successful execution to project completion.

# 2. Project Scope

---

Construction of Natural Bypass Channels around Claiborne Dam and Millers Ferry Dam. In addition, construction of bridges over both the bypass channels at both locations and remotely operable gates at the Millers Ferry Dam site.

# 3. Key Assumptions

---

The following data sources and assumptions were used in the preparation of this CSRA:

- The estimate files that serve as a most-likely cost estimate. These files served as the basis for the final cost and schedule risk analyses.
- The cost comparisons and risk analyses performed and reflected within this report are based on design scope and estimates that are at the feasibility level of design.
- Schedules are analyzed for impact to the project cost in terms of delayed funding, uncaptured escalation (variance from OMB factors and the local market) and unavoidable fixed contract costs and/or continuing federal administration costs incurred throughout delay.
- The Cost Engineering MCX guidance generally focuses on the 80% level of confidence (P80) for cost contingency calculation. For this risk analysis, the 80% level of confidence was used. It should be noted that the use of P80 as a decision criteria is a moderately risk averse approach, generally resulting in higher cost contingencies.
- Only high and moderate risk level impacts, as identified in the risk register, were considered for the purposes of calculating cost contingency. Low level risk impacts should be maintained in project management documentation and reviewed at each project milestone to determine if they should be placed on the risk “watch list”.

# 4. Cost & Schedule Risk Analysis Process

---

The risk analysis process for this study follows the USACE Headquarters requirements as well as the guidance provided by the Cost Engineering MCX. The risk analysis process reflected within this report uses probabilistic cost and schedule risk analysis methods within the framework of the Crystal Ball software. Furthermore, the scope of the report includes the identification and communication of important steps, logic, key assumptions, limitations, and decisions to help ensure that risk analysis results can be appropriately interpreted.

Risk analysis results are also intended to provide project leadership with contingency information for scheduling, budgeting, and project control purposes, as well as to provide tools to support decision making and risk management as the project progresses through planning and implementation. To fully recognize its benefits, cost and schedule risk analysis should be considered as an ongoing process conducted

concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting, and scheduling.

In addition to broadly defined risk analysis standards and recommended practices, this risk analysis was performed to meet the requirements and recommendations of the following documents and sources:

- Cost and Schedule Risk Analysis Process guidance prepared by the USACE Cost Engineering MCX.
- Engineer Regulation (ER) 1110-2-1302 CIVIL WORKS COST ENGINEERING, dated June 30, 2016.

## 5. Base Estimate

---

See Appendix A for a summary of the base cost estimate from which this CSRA was conducted.

## 6. Base Schedule

---

See Appendix B for a summary of the base schedule from which this CSRA was conducted.

## 7. Cost & Schedule Risk Analysis

---

The CSRA results are provided in the following sections. In addition to contingency calculation results, the top cost and schedule risks were identified, and sensitivity analyses are presented to provide decision makers with:

- An understanding of variability and the key contributors,
- Contingency information for scheduling, budgeting, and project control purposes, and
- Provide tools to support decision making and risk management as projects progress through planning and implementation.

Additional information and details can be found in various Appendix C subsections which are described below.

- **Appendix C-1: Risk Dashboards.** Summary of the top cost & schedule risk items, confidence levels, and suggested risk reduction measures.
- **Appendix C-2: Contingency Summary.** Summary of the various contingency values for cost & schedule by confidence level.
- **Appendix C-3: Sensitivity Charts.** Summary of the major cost & schedule risk items along with a graphical representation of their potential range of impacts at the 80% confidence levels.
- **Appendix C-4: Risk Register.** Summary of the risk register documenting risk type, risk details, likelihood, impact ratings, responsibility.
- **Appendix C-5: CSRA Assumptions.** Summary of the risk matrix, likelihood of occurrence definition, impact or consequence definitions for cost / schedule, and cost / schedule impact ranges as they relate to this project.
- **Appendix C-6: Risk Register Attendance.** Summary of the participants of the risk register meeting which was conducted on 12/1/2023.

### 7.1. Summary of Results

The base estimate is approximately \$149M excluding contingency (Estimated Cost, Column C on the TPCS). Based on the results of the analysis, the CSRA recommends a contingency value of \$44.7M, or approximately 30% of base estimate at the 80% confidence level of successful execution. The base schedule is approximately 64.1 months excluding contingency. Based on the results of the analysis, the

CSRA recommends a contingency value of almost 28.6 months, or approximately 45% of base schedule at the 80% confidence level of successful execution. See Table 1 below for a more detailed summary and Appendix C for additional details regarding risk-based contingency development.

Table 1. Summary of CSRA Results

Contingency on Base Estimate		80% Confidence Project Cost	
Base Estimate ->		\$148,970,000	
Estimate Contingency ->		\$44,691,000	30.0%
Base Estimate w/ Contingency (80% Confidence) ->		\$193,661,000	

Contingency on Base Schedule		80% Confidence Project Schedule	
Base Schedule Start Date ->		October 1, 2027	
Base Schedule Finish Date ->		February 1, 2033	
Base Schedule Duration ->		64.1 Months	
Schedule Contingency Duration ->		28.6 Months	44.6%
Base Schedule w/ Contingency (80% Confidence) ->		92.7 Months	
Base Finish Date w/ Contingency (80% Confidence) ->		June 19, 2035	

## 7.2. Cost Risk Analysis

### 7.2.1. Cost Confidence Levels

The result of risk or uncertainty analysis is quantification of the cumulative impact of all analyzed risks or uncertainties as compared to probability of occurrence. These results, as applied to the analysis herein, depict the overall base estimate with contingency at intervals of confidence (probability). Table 2 provides the cost contingencies calculated for the various confidence levels with the 80% confidence level highlighted. Figure 1 presents this information graphically. Contingencies are rounded up to the nearest whole percentage.

Table 2. Cost Confidence Levels

Base Estimate ->	\$148,970,000	
Confidence Level	Contingency Value	Contingency
0%	5,958,800	4%
10%	20,855,800	14%
20%	25,324,900	17%
30%	28,304,300	19%
40%	31,283,700	21%
50%	34,263,100	23%
60%	37,242,500	25%
70%	40,221,900	27%
<b>80%</b>	<b>44,691,000</b>	<b>30%</b>
90%	50,649,800	34%
100%	72,995,300	49%

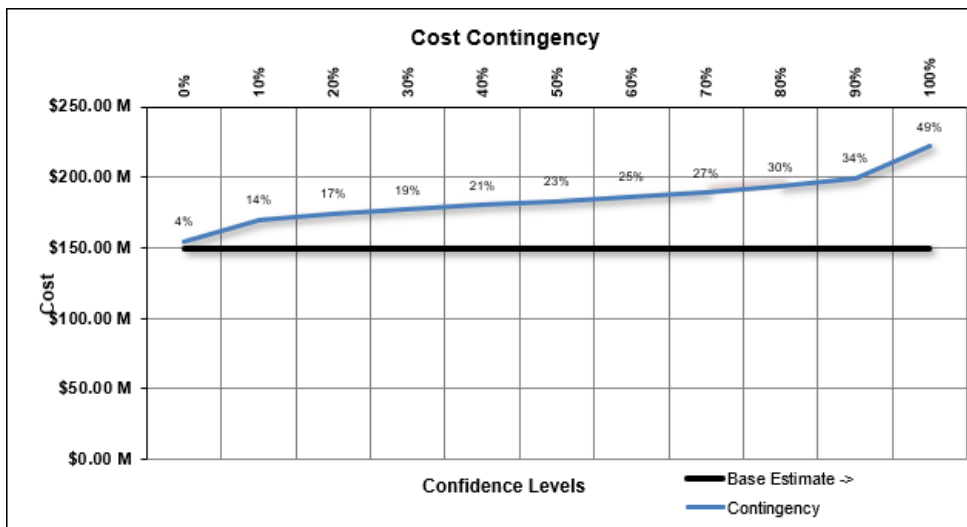


Figure 1. Cost Contingency Levels

### 7.2.2. Top Cost Risks

The risks/opportunities considered as key or primary cost drivers are ranked in order of potential impact (positive or negative) in Figure 2 at 80% confidence level. Opportunities are shown with a negative sign to reflect the potential to decrease cost; risks are shown with a positive sign to reflect the potential to increase cost. These key cost drivers can be used to support development of a risk management plan that will facilitate control of risk factors and their potential impacts throughout the project lifecycle. Together with the risk register, these results can also be used to support development of strategies to eliminate, mitigate, accept, or transfer key risks. See Appendix C for additional details for these risks and further information regarding CSRA development.

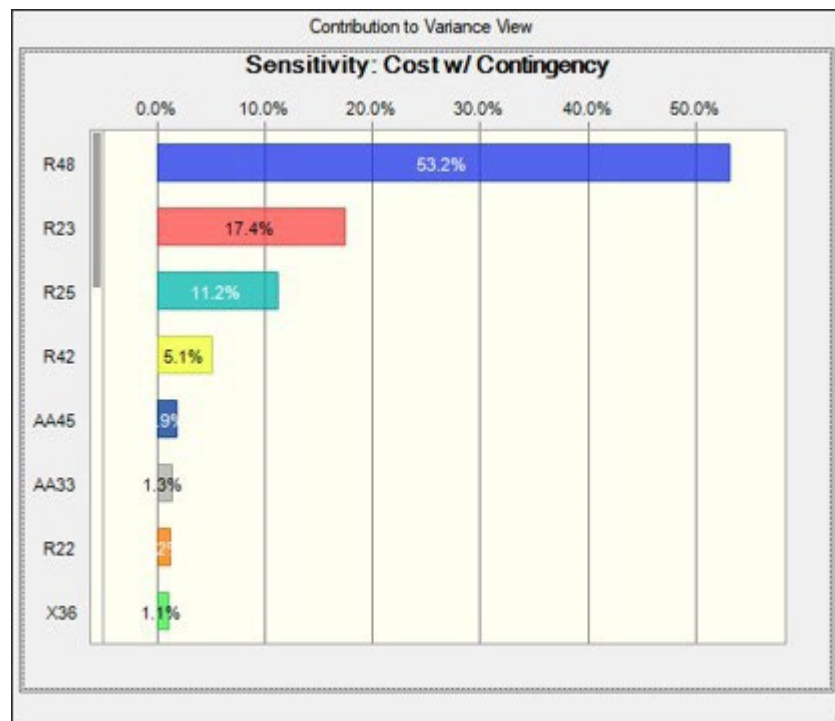


Figure 2. Top Cost Risks

- **R48: Inflation.** General inflation could occur during the next few years, as has been experienced in the past few months.
- **R23: Acquisition Type and Acquisition Delays.** Issuance of multiple amendments could delay RFP due date and subsequently award of the contract. Multiple contracting methods available (IFB, RFP, MATOC) which represents uncertainty in contract cost and schedule. Competition and equipment types could vary. Acquisition type will be determined during the beginning of the design phase. IFB is the most likely contract acquisition method for this type and size of work.
- **R25: PED.** Concerns that refined modeling performed during PED may result in changes being made to the layout of the bypass channels. Further modeling planned for PED will detail velocity through the channels and may indicate a need for different channel geometry or armoring than currently planned. Existing structures may require improvement due to additional loads from the bypass channels. This risk item includes the concerns for quantity changes for the bypass channels.
- **R42: Fuel Prices.** The current annual fuel price trend has been very volatile in the short term for the last several years increases or decreases are hard to forecast. Price swings of \$1 down or \$2 up are assumed based on the spread since November 2020.
- **AA45: Court Injunctions.** Several public comments were received during the study phase that could be interpreted as basis for intent to pursue litigation. Litigation would pause development but is most likely to occur during the PED phase of implementation.
- **AA33: NEPA.** A tiered Environmental Assessment could be necessitated by either redesign or litigation.
- **R22: Bidding Climate.** Based upon the type of work and relatively remote project sites, it is likely that only a few contractors may be interested in the job depending on their other workload. This could result in higher prices. It is also possible that potential contractors could be desperate for work at the time this contract is being bid, driving prices for heavy construction lower.
- **X36: Spoil Areas.** A potential spoil area has been identified where the cut material can be disposed. The study assumption is that the necessary land will be available, the only change would be in hauling distance. Due to the large amount of cut materials to be disposed, changes in hauling distance could have significant cost and schedule impacts.

### 7.3. Schedule Risk Analysis

#### 7.3.1. Schedule Confidence Levels

The result of risk or uncertainty analysis is quantification of the cumulative impact of all analyzed risks or uncertainties as compared to probability of occurrence. These results, as applied to the analysis herein, depict the overall schedule duration at intervals of confidence (probability). Table 3 provides the schedule duration contingencies calculated for the various confidence levels with the 80% confidence level highlighted. Figure 3 presents this information graphically. Contingencies are rounded up to the nearest whole percentage.

Table 3. Schedule Confidence Levels

Base Schedule Duration ->	64.1 Months	
Confidence Level	Contingency Value	Contingency
0%	2.6 Months	5%
10%	9.8 Months	16%
20%	12.4 Months	20%
30%	15.6 Months	25%
40%	18.9 Months	30%
50%	20.8 Months	33%
60%	23.4 Months	37%
70%	25.4 Months	40%
<b>80%</b>	<b>28.6 Months</b>	<b>45%</b>
90%	33.2 Months	52%
100%	50.1 Months	79%

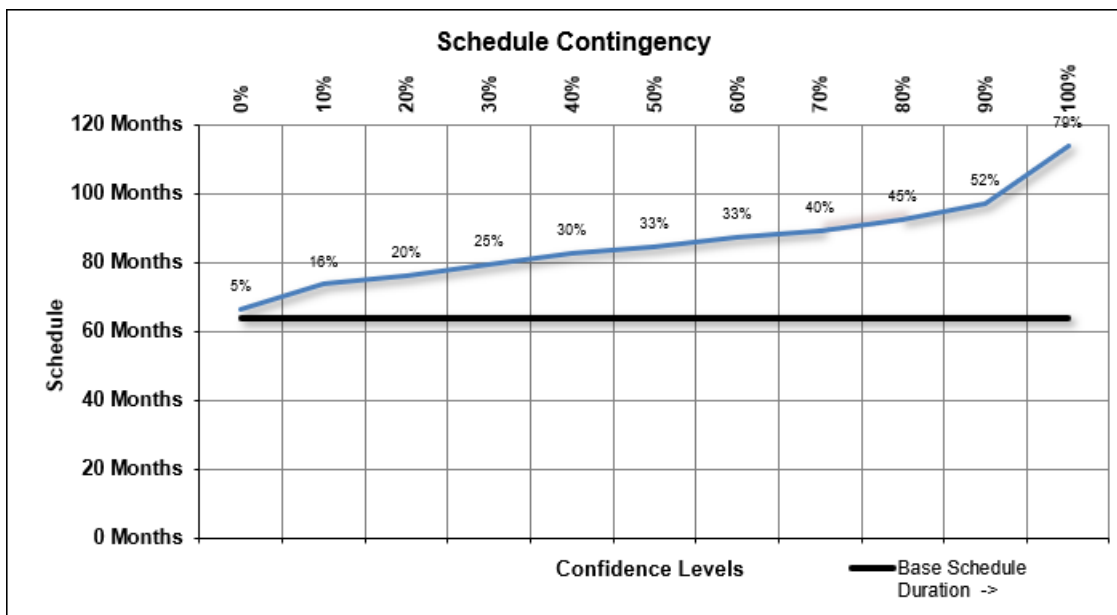


Figure 3. Schedule Contingency Levels

These contingencies were also used to calculate the projected residual fixed cost impact of project delays that are included in the Table 2 presentation of total cost contingency. The schedule contingencies were calculated by applying the high-level schedule risks identified in the risk register for each option to the durations of critical path and near critical path tasks.

### 7.3.2. Top Schedule Risks

The risks/opportunities considered as key or primary schedule drivers are ranked in order of potential impact (positive or negative) in Figure 4 at various confidence level 80%. Opportunities are shown with a negative sign to reflect the potential to decrease schedule duration; risks are shown with a positive sign to reflect the potential to increase schedule duration. These key schedule drivers can be used to support development of a risk management plan that will facilitate control of risk factors and their potential impacts throughout the project lifecycle. Together with the risk register, sensitivity analysis results can also be used to support development of strategies to eliminate, mitigate, accept, or transfer key risks. See Appendix C for additional details for these risks and further information regarding CSRA development.

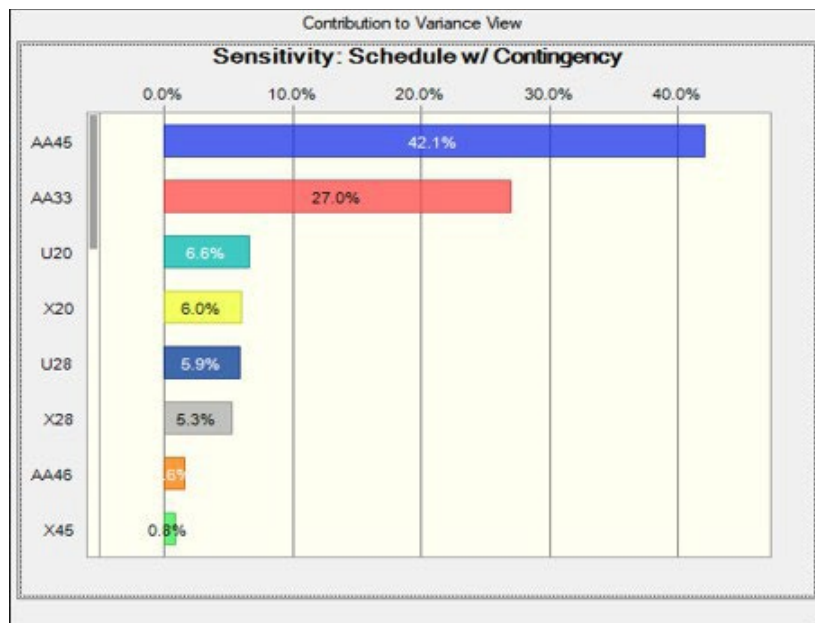


Figure 4. Top Schedule Risks

- **AA45 & X45: Court Injunctions.** Several public comments were received during the study phase that could be interpreted as basis for intent to pursue litigation. Litigation would pause development but is most likely to occur during the PED phase of implementation.
- **AA33: NEPA.** A tiered Environmental Assessment could be necessitated by either redesign or litigation.
- **U20 & X20: Project Partnership Agreement Issues.** The start of work after authorization could be delayed if PPA is not executed in a timely manner. The study non-Federal sponsor has been very involved, responsive, and cooperative during the study phase, but a Governmental NFS will be required and has not been identified for the implementation.
- **U28 & X28: Able to Identify NFS.** NFS for Construction has not been identified. The NFS for feasibility study is non-governmental and numerous discussions have been had by the PDT that a government agency will be required to be the NFS for construction due to requirements for Real Estate acquisition. It is possible that once authorized, a suitable sponsor is not found, and agreements are not approved on normal schedules.
- **AA46: Severe Weather and other Acts of God.** The construction sites experience flood conditions nearly every year. Risk of flooding is considered exceeding normal amounts that would delay the project and could require remobilization.

See Appendix C for additional details for these risks and further information regarding CSRA development.

## **8. Recommendations, Risk Management, & Updates**

### **8.1. Recommendations**

Risk Management is an all-encompassing, iterative, and life-cycle process of project management. The Project Management Institute's (PMI) *A Guide to the Project Management Body of Knowledge (PMBOK® Guide), Sixth Edition*, states that "project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project." Risk identification and analysis are processes within the knowledge area of risk management. Its outputs pertinent to this effort include the risk register, risk quantification (risk analysis model), contingency report, and the sensitivity analysis.

The intended use of these outputs is implementation by the project leadership with respect to risk responses (such as mitigation) and risk monitoring and control. In short, the effectiveness of the project risk management effort requires that the proactive management of risks not conclude with the study completed in this report.

The CSRA produced by the PDT identifies issues that require the development of subsequent risk response and mitigation plans. This section provides a list of recommendations for continued management of the risks identified and analyzed in this study. Note that this list is not all inclusive and should not substitute a formal risk management and response plan.

The CSRA study serves as a "road map" towards project improvements and reduced risks over time. The PDT should include the recommended cost and schedule contingencies and incorporate risk monitoring and mitigation on those identified risks. Further iterative study and update of the risk analysis throughout the project life cycle is important in support of remaining within an approved budget and appropriation.

### **8.2. Risk Management**

Project leadership should use the outputs created during the risk analysis effort as tools in future risk management processes. The risk register should be updated at each major project milestone. The results of the sensitivity analysis may also be used for response planning strategy and development. These tools should be used in conjunction with regular risk review meetings.

### **8.3. Risk Analysis Updates**

Project leadership should review risk items identified in the original risk register and add others, as required, throughout the project life cycle. Risks should be reviewed for status and reevaluation (using qualitative measure, at a minimum) and placed on risk management watch lists if any risk's likelihood or impact significantly increases. Project leadership should also be mindful of the potential for secondary (new risks created specifically by the response to an original risk) and residual risks (risks that remain and have unintended impact following response).

## **Appendix A**

### **Base Estimate**

### Cost Summary for Risk Register Development

Project: **Claiborne and Millers Ferry Locks and Dams Fish Passage**

Project Development Stage/Alternative: **Feasibility Milestone #4 - CWRB**

Risk Category: **Moderate Risk: Typical Project or Possible Life Safety**

Meeting Date: 12/1/2023

Schedule Duration: Oct-2027 Feb-2033  
From (Month/Year) From (Month/Year)

Schedule Duration: 65.0 Months 45%  
Schedule Contingency

80% Finish Date Jun-2035

WBS	Feature of Work	Base Cost	80% Confidence	80% Confidence (\$)	80% Total
Risk Not included within USRA Model					
01	LANDS AND DAMAGES Real Estate	\$ 518,000	25%	\$ 129,500	\$ 647,500
Risk included within USRA Model					
1	06 01 FISH FACILITIES AT DAMS Claborne - Excavation and Haul Off	\$ 6,392,000	30%	\$ 1,917,600	\$ 8,309,600
2	06 01 FISH FACILITIES AT DAMS Claborne - Rock Lining and Weirs	\$ 7,611,000	30%	\$ 2,283,300	\$ 9,894,300
3	06 01 FISH FACILITIES AT DAMS Claborne - Dry Island Armoring	\$ 15,478,000	30%	\$ 4,643,400	\$ 20,121,400
4	06 01 FISH FACILITIES AT DAMS Claborne - Other FOWs	\$ 7,053,000	30%	\$ 2,115,900	\$ 9,168,900
5	06 01 FISH FACILITIES AT DAMS Millers Ferry - Excavation and Haul Off	\$ 20,587,000	30%	\$ 6,176,100	\$ 26,763,100
6	06 01 FISH FACILITIES AT DAMS Millers Ferry - Rock Lining and Weirs	\$ 31,479,000	30%	\$ 9,443,700	\$ 40,922,700
7	06 01 FISH FACILITIES AT DAMS Millers Ferry - Fish Deterrent	\$ 16,424,000	30%	\$ 4,927,200	\$ 21,351,200
8	06 01 FISH FACILITIES AT DAMS Milers Ferry - Other FOWs	\$ 9,374,000	30%	\$ 2,812,200	\$ 12,186,200
9		\$ -	0%	\$ -	\$ -
10		\$ -	0%	\$ -	\$ -
11		\$ -	0%	\$ -	\$ -
12		\$ -	0%	\$ -	\$ -
13		\$ -	0%	\$ -	\$ -
14		\$ -	0%	\$ -	\$ -
15		\$ -	0%	\$ -	\$ -
16		\$ -	0%	\$ -	\$ -
17		\$ -	0%	\$ -	\$ -
18		\$ -	0%	\$ -	\$ -
19		\$ -	0%	\$ -	\$ -
20		\$ -	0%	\$ -	\$ -
21		\$ -	0%	\$ -	\$ -
22		\$ -	0%	\$ -	\$ -
23	30 PLANNING, ENGINEERING, AND DESIGN Planning, Engineering, & Design	\$ 22,560,000	30%	\$ 6,768,000	\$ 29,328,000
24	31 CONSTRUCTION MANAGEMENT Construction Management	\$ 12,012,000	30%	\$ 3,603,600	\$ 15,615,600
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)			\$ -	
<b>Totals</b>					
	Real Estate	\$ 518,000	25%	\$ 129,500	\$ 647,500.00
	Total Construction Estimate	\$ 114,398,000	30%	\$ 34,319,400	\$ 148,717,400
	Total Planning, Engineering & Design	\$ 22,560,000	30%	\$ 6,768,000	\$ 29,328,000
	Total Construction Management	\$ 12,012,000	30%	\$ 3,603,600	\$ 15,615,600
	<b>Total</b>	<b>\$ 149,488,000</b>	<b>30%</b>	<b>\$ 44,820,500</b>	<b>\$ 194,308,500</b>
PROGRAMMED AMOUNT ( IF KNOWN)					<b>\$4,100,000</b>

# Appendix B

## Base Schedule



# Appendix C

## Cost & Schedule Risk Analysis Details

## **Appendix C-1**

### **Risk Dashboards**

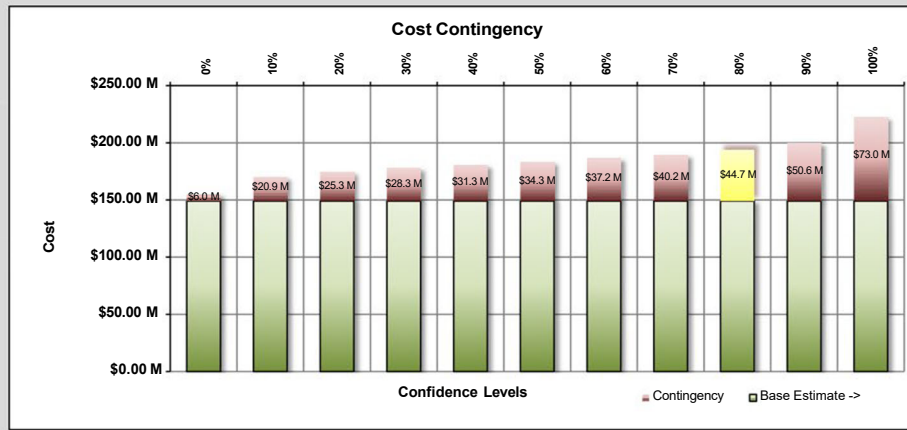
Project: **Claiborne and Millers Ferry Locks and Dams Fish Passage**

Overall Risk Level

Cost: **High**

Schedule: **Medium**

Location: **Alabama**



Contingency on Base Estimate		80% Confidence Project Cost
Base Estimate ->		\$148,970,000
Estimate Contingency ->		\$44,691,000
Base Estimate w/ Contingency (80% Confidence) ->		\$193,661,000
		<b>30%</b>

Contingency on Base Schedule		80% Confidence Project Schedule
Base Schedule Start Date ->		October 1, 2027
Base Schedule Finish Date ->		February 1, 2033
Base Schedule Duration ->		64.1 Months
Schedule Contingency Duration ->		28.6 Months
Base Schedule w/ Contingency (80% Confidence) ->		92.7 Months
Base Finish Date w/ Contingency (80% Confidence) ->		June 19, 2035
		<b>45%</b>

**Project Description**  
 Construction of Natural Bypass Channels around Claiborne Dam and Millers Ferry Dam. In addition, construction of bridges over both bypass channels and remote operable gates at the Millers Ferry.

**TOP COST RISKS**

Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Risk Level		Suggested Risk Reduction Measures (Avoid, Escalate, Exploit, Transfer/Share, Mitigate/Enhance, or Accept)
			Cost	Schedule	
1	Funding Stream / Appropriations (Fed)  Receipt of Federal Funding is anticipated but unsure due to future funding constraints.  What is likelihood of Federal fundings issues?	Congressional budget uncertainty / lateness could result in funding delays over the length of this project.			
2	Schedule Delay - Staffing and Priorities  Priorities of PDT members may cause a slip in schedule.  Impact from a lack of PED labor available locally.	This risk is for the impact of no available PED labor. If this labor is not done by the District, then it can be brokered to another district or contracted out to an A/E. Either of those options should cause negligible impacts to the cost and schedule, but marginal impacts are possible. Similar concerns exist for PM staff overseeing the funding request, design, and construction.	Low	Low	
3	PPA Issues  New authority will require new PPA	The start of work after authorization could be delayed if PPA is not executed in a timely manner. The study NFS sponsor has been very involved, responsive, and cooperative during the study phase, but a Governmental NFS will be required and has not been identified for the implementation.	Low	High	
4	Project Execution  There is a risk the District could have multiple large projects concurrently in construction, resulting in potential schedule delays due to the districts inability to execute several hundred millions worth of construction yearly.	Project execution due to workload districtwide could be an impact. Priority is for the large projects, this one would be a large and highly visible project. Engineering design and Construction is anticipated to go to an A-E rather than be performed in-house, so likelihood of de-prioritization of this project is small.	Low	Low	
5	Bidding Climate  Limited competition and/or heavy industry workload could impact bids.	Based upon the type of work and relatively remote project sites, it is likely that only a few contractors may be interested in the job depending on their other workload. This could result in higher prices. It is also possible that potential contractors could be desperate for work at the time this contract is being bid, driving prices for heavy construction lower.	Medium	Low	
6	Acquisition Type and Acquisition Delays  Acquisition Strategy affects contract prices and competition.	Issuance of multiple amendments could delay RFP due date and subsequently award of the contract. Multiple contracting methods available (IFB, RFP, MATOC) which represents uncertainty in contract cost and schedule. Competition and equipment types could vary. Acquisition type will be determined during the beginning of the design phase. IFB is the most likely contract acquisition method for this type and size of work. Historically IFB acquisition would give the most	Medium	Low	
7	Scope Changes  What is the likelihood that the project scope could be changed	The scope is very likely to remain Bypass Channels. Potential for scope changes to a different type of fish passages minimal without necessitating a re-evaluation that could not be captured in the risk to the current scope. If scope re-evaluation occurs, it is not anticipated to impact cost but is likely to moderate impact schedule.	Low	Low	
8	PED  Modeling efforts to determine flow through bypass channels	The PDT has concerns that refined modeling performed during PED may result in changes being made to the layout of the bypass channels. Further modeling planned for PED will detail velocity through the channels and may indicate a need for different channel geometry or armoring than currently planned. Existing Structures may require improvement due to additional loads from the bypass channels. This risk item includes the concerns for quantity changes for the bypass channels.	High	Low	

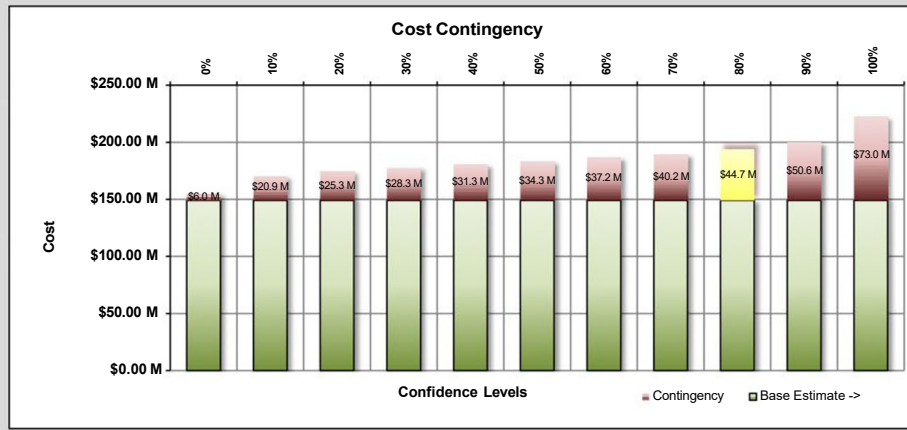
Project: **Claiborne and Millers Ferry Locks and Dams Fish Passage**

Overall Risk Level

Cost: **High**

Schedule: **Medium**

Location: **Alabama**



Contingency on Base Estimate		80% Confidence Project Cost
Base Estimate ->	\$148,970,000	
Estimate Contingency ->	\$44,691,000	<b>30%</b>
Base Estimate w/ Contingency (80% Confidence) ->	\$193,661,000	

Contingency on Base Schedule		80% Confidence Project Schedule
Base Schedule Start Date ->	October 1, 2027	
Base Schedule Finish Date ->	February 1, 2033	
Base Schedule Duration ->	64.1 Months	<b>45%</b>
Schedule Contingency Duration ->	28.6 Months	
Base Schedule w/ Contingency (80% Confidence) ->	92.7 Months	
Base Finish Date w/ Contingency (80% Confidence) ->	June 19, 2035	

**Project Description**  
 Construction of Natural Bypass Channels around Claiborne Dam and Millers Ferry Dam. In addition, construction of bridges over both bypass channels and remote operable gates at the Millers Ferry.

9	Character of Materials	Do we have adequate geotechnical data available to accurately characterize the material prior to construction?	The Project Geotechnical Engineer is lacking much existing investigation reports from along the project alignments. relatively conservative estimates have been used for structure foundations and confidence is good that bedrock will not be encountered during excavations, but investigations during PED may result in changes in foundation design, channel design, or excavation productivity.	Medium	Low
10	Site Access, Staging Areas & Construction Easements	Have all access and staging areas been established?	Staging areas have been identified on the Conceptual drawings.	Low	Low

**TOP SCHEDULE RISKS**

Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Risk Level		Suggested Risk Reduction Measures (Avoid, Escalate, Exploit, Transfer/Share, Mitigate/Enhance, or Accept)
			Cost	Schedule	
1	Funding Stream / Appropriations (Fed)	Receipt of Federal Funding is anticipated but unsure due to future funding constraints.  What is likelihood of Federal fundings issues?			
2	Schedule Delay - Staffing and Priorities	Priorities of PDT members may cause a slip in schedule.  Impact from a lack of PED labor available locally.	Low	Low	
3	PPA Issues	New authority will require new PPA	Low	High	
4	Project Execution	There is a risk the District could have multiple large projects concurrently in construction, resulting in potential schedule delays due to the districts inability to execute several hundred millions worth of construction yearly.	Low	Low	
5	Bidding Climate	Limited competition and/or heavy industry workload could impact bids.	Medium	Low	
6	Acquisition Type and Acquisition Delays	Acquisition Strategy affects contract prices and competition.	Medium	Low	
7	Scope Changes	What is the likelihood that the project scope could be changed	Low	Low	

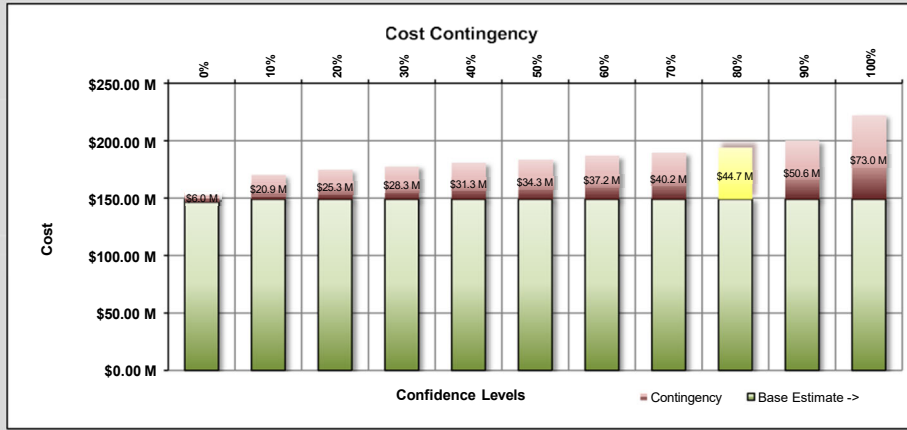
Project: Claiborne and Millers Ferry Locks and Dams Fish Passage

Overall Risk Level

Cost: High

Schedule: Medium

Location: Alabama



Contingency on Base Estimate		80% Confidence Project Cost
Base Estimate ->	\$148,970,000	
Estimate Contingency ->	\$44,691,000	<b>30%</b>
Base Estimate w/ Contingency (80% Confidence) ->	\$193,661,000	

Contingency on Base Schedule		80% Confidence Project Schedule
Base Schedule Start Date ->	October 1, 2027	
Base Schedule Finish Date ->	February 1, 2033	
Base Schedule Duration ->	64.1 Months	
Schedule Contingency Duration ->	28.6 Months	<b>45%</b>
Base Schedule w/ Contingency (80% Confidence) ->	92.7 Months	
Base Finish Date w/ Contingency (80% Confidence) ->	June 19, 2035	

**Project Description**  
 Construction of Natural Bypass Channels around Claiborne Dam and Millers Ferry Dam. In addition, construction of bridges over both bypass channels and remote operable gates at the Millers Ferry.

8	PED	Modeling efforts to determine flow through bypass channels	The PDT has concerns that refined modeling performed during PED may result in changes being made to the layout of the bypass channels. Further modeling planned for PED will detail velocity through the channegls and may indicate a need for different channel geometry or armoring than currently planned. Existing Structures may require improvement due to additional loads from the bypass channels. this risk item includes the concerns for quantity changes for the bypass channels.	High	Low	
9	Character of Materials	Do we have adequate geotechnical data available to accurately characterize the material prior to construction?	The Project Geotechnical Engineer is lacking much existing investigation reports from along the project alignments. relatively conservative estimates have been used for structure foundations and confidence is good that bedrock will not be encountered during excavations, but investigations during PED may result in changes in foundation design, channel design, or excavation productivity.	Medium	Low	
10	Site Access, Staging Areas & Construction Easements	Have all access and staging areas been established?	Staging areas have been identified on the Conceptual drawings,	Low	Low	

## **Appendix C-2**

### **Contingency Summary**

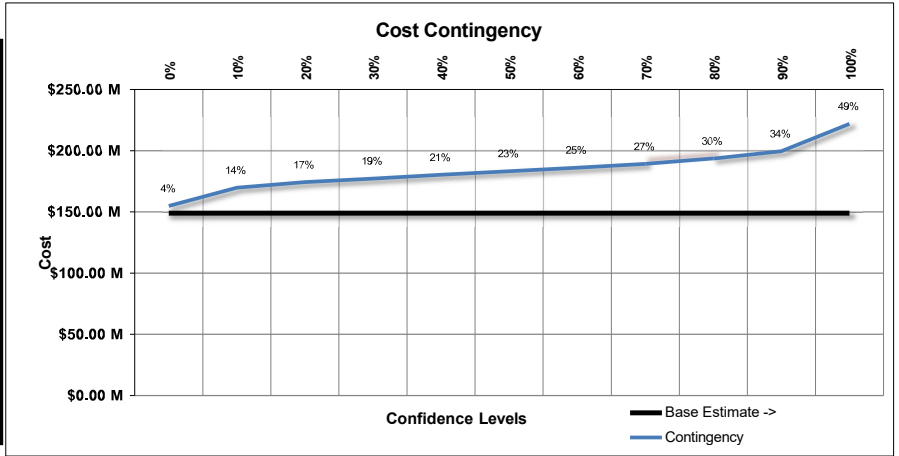
Contingency on Base Estimate		80% Confidence Project Cost
Base Estimate ->		\$148,970,000
Estimate Contingency ->		\$44,691,000 30.0%
Base Estimate w/ Contingency (80% Confidence) ->		\$193,661,000

Contingency on Base Schedule		80% Confidence Project Schedule
Base Schedule Start Date ->		October 1, 2027
Base Schedule Finish Date ->		February 1, 2033
Base Schedule Duration ->		64.1 Months
Schedule Contingency Duration ->		28.6 Months 44.6%
Base Schedule w/ Contingency (80% Confidence) ->		92.7 Months
Base Finish Date w/ Contingency (80% Confidence) ->		June 19, 2035

**- PROJECT CONTINGENCY DEVELOPMENT -**

**INITIAL CONSTRUCTION  
 Contingency Analysis**

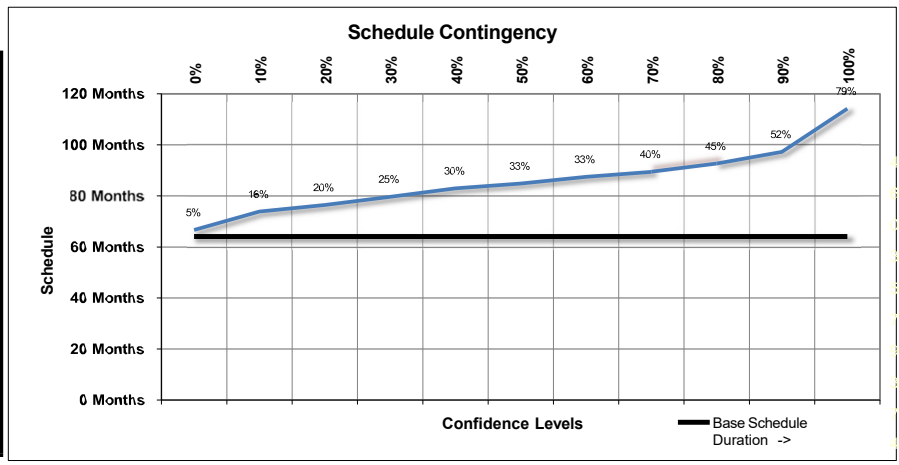
Base Estimate ->	\$148,970,000	
Confidence Level	Contingency Value	Contingency
0%	5,958,800	4%
10%	20,855,800	14%
20%	25,324,900	17%
30%	28,304,300	19%
40%	31,283,700	21%
50%	34,263,100	23%
60%	37,242,500	25%
70%	40,221,900	27%
<b>80%</b>	<b>44,691,000</b>	<b>30%</b>
90%	50,649,800	34%
100%	72,995,300	49%



**- SCHEDULE CONTINGENCY (DURATION) DEVELOPMENT -**

**Contingency Analysis**

Base Schedule Duration ->	64.1 Months	
Confidence Level	Contingency Value	Contingency
0%	2.6 Months	5%
10%	9.8 Months	16%
20%	12.4 Months	20%
30%	15.6 Months	25%
40%	18.9 Months	30%
50%	20.8 Months	33%
60%	23.4 Months	37%
70%	25.4 Months	40%
<b>80%</b>	<b>28.6 Months</b>	<b>45%</b>
90%	33.2 Months	52%
100%	50.1 Months	79%



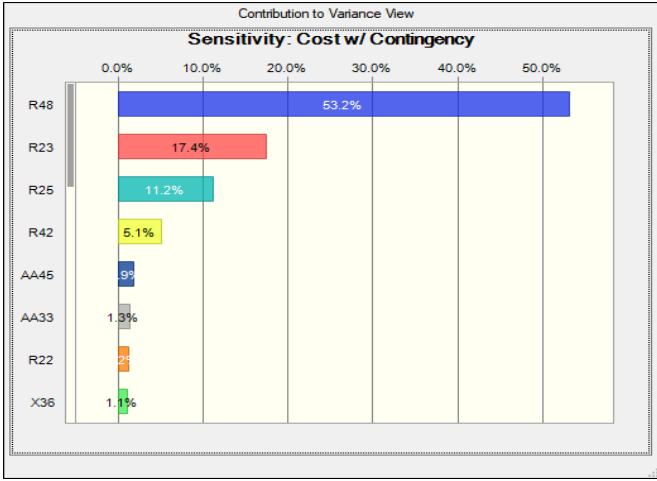
## **Appendix C-3**

### **Sensitivity Charts**

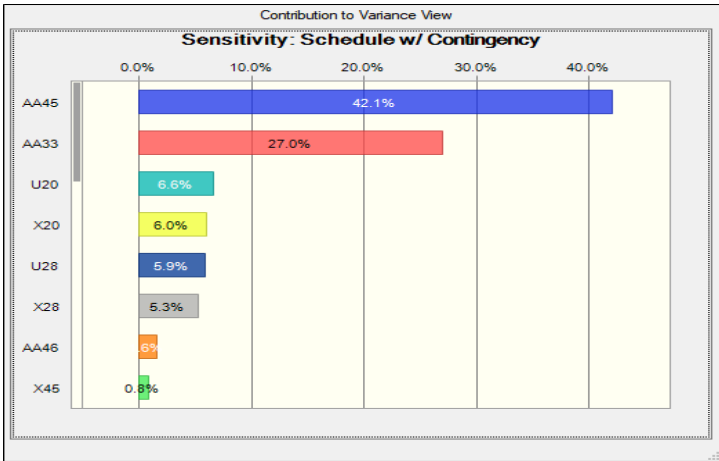
Contingency on Base Estimate		80% Confidence Project Cost	
Base Estimate ->		\$148,970,000	
Estimate Contingency ->		\$44,691,000	30%
Base Estimate w/ Contingency (80% Confidence) ->		\$193,661,000	

Contingency on Base Schedule		80% Confidence Project Schedule	
Base Schedule Start Date ->		October 1, 2027	
Base Schedule Finish Date ->		February 1, 2033	
Base Schedule Duration ->		64.1 Months	
Schedule Contingency Duration ->		28.6 Months	45%
Base Schedule w/ Contingency (80% Confidence) ->		92.7 Months	
Base Finish Date w/ Contingency (80% Confidence) ->		June 19, 2035	

**- Cost Outputs Distribution and Sensitivity -**



**- Schedule Outputs Distribution and Sensitivity -**



# Appendix C-4

## Risk Register

Claiborne and Millers Ferry Locks and Dams Fish Passage - Feasibility Milestone #4 - CWRB December 2023						Project Cost			Project Schedule		
REF	Risk Type	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Likelihood (C)	Impact (C)	Risk Level (C)	Likelihood (S)	Impact (S)	Risk Level (S)	
1	01 - Project & Program Management (PM)	Funding Stream / Appropriations (Fed)	Receipt of Federal Funding is anticipated but unsure due to future funding constraints.  What is likelihood of Federal fundings issues?	Congressional budget uncertainty / lateness could result in funding delays over the length of this project.	Unrated	Negligible	#N/A	Unrated	Critical	#N/A	
2	01 - Project & Program Management (PM)	Schedule Delay - Staffing and Priorities	Priorities of PDT members may cause a slip in schedule.  Impact from a lack of PED labor available locally.	This risk is for the impact of no available PED labor. If this labor is not done by the District, then it can be brokered to another district or contracted out to an A/E. Either of those options should cause negligible impacts to the cost and schedule, but marginal impacts are possible. Similar concerns exist for PM staff overseeing the funding request, design, and construction.	Possible	Marginal	Low	Possible	Marginal	Low	
3	01 - Project & Program Management (PM)	PPA Issues	New authority will require new PPA	The start of work after authorization could be delayed if PPA is not executed in a timely manner. The study NFS sponsor has been very involved, responsive, and cooperative during the study phase, but a Governmental NFS will be required and has not been identified for the implementation.	Likely	Negligible	Low	Likely	Critical	High	
4	01 - Project & Program Management (PM)	Project Execution	There is a risk the District could have multiple large projects concurrently in construction, resulting in potential schedule delays due to the districts inability to execute several hundred millions worth of construction yearly.	Project execution due to workload districtwide could be an impact. Priority is for the large projects, this one would be a large and highly visible project. Engineering design and Construction is anticipated to go to an A-E rather than be performed in-house, so likelihood of de-prioritization of this project is small.	Unlikely	Marginal	Low	Unlikely	Marginal	Low	
5	05 - Contract Acquisition Risks (CA)	Bidding Climate	Limited competition and/or heavy industry workload could impact bids.	Based upon the type of work and relatively remote project sites, it is likely that only a few contractors may be interested in the job depending on their other workload. This could result in higher prices. It is also possible that potential contractors could be desperate for work at the time this contract is being bid, driving prices for heavy construction lower.	Possible	Significant	Medium	Possible	Marginal	Low	
6	05 - Contract Acquisition Risks (CA)	Acquisition Type and Acquisition Delays	Acquisition Strategy affects contract prices and competition.	Issuance of multiple amendments could delay RFP due date and subsequently award of the contract. Multiple contracting methods available (IFB, RFP, MATOC) which represents uncertainty in contract cost and schedule. Competition and equipment types could vary. Acquisition type will be determined during the beginning of the design phase. IFB is the most likely contract acquisition method for this type and size of work. Historically IFB acquisition would give the most competition and best pricing.	Unlikely	Critical	Medium	Unlikely	Marginal	Low	
7	13 - Civil/Site Design (CV)	Scope Changes	What is the likelihood that the project scope could be changed	The scope is very likely to remain Bypass Channels. Potential for scope changes to a different type of fish passage is minimal without necessitating a re-evaluation that could not be captured in the risk to the current scope. If scope re-evaluation occurs, it is not anticipated to impact cost but is likely to moderate impact schedule.	Unlikely	Marginal	Low	Unlikely	Moderate	Low	
8	18 - Hydraulics / Hydrology (HH)	PED	Modeling efforts to determine flow through bypass channels	The PDT has concerns that refined modeling performed during PED may result in changes being made to the layout of the bypass channels. Further modeling planned for PED will detail velocity through the channels and may indicate a need for different channel geometry or armoring than currently planned. Existing Structures may require improvement due to additional loads from the bypass channels. This risk item includes the concerns for quantity changes for the bypass channels.	Possible	Critical	High	Possible	Marginal	Low	
9	17 - Geotechnical / Geology (GG)	Character of Materials	Do we have adequate geotechnical data available to accurately characterize the material prior to construction?	The Project Geotechnical Engineer is lacking much existing investigation reports from along the project alignments. relatively conservative estimates have been used for structure foundations and confidence is good that bedrock will not be encountered during excavations, but investigations during PED may result in changes in foundation design, channel design, or excavation productivity.	Possible	Moderate	Medium	Possible	Marginal	Low	
10	03 - Ability to Execute (AB)	Site Access, Staging Areas & Construction Easements	Have all access and staging areas been established?	Staging areas have been identified on the Conceptual drawings,	Possible	Marginal	Low	Possible	Marginal	Low	

Claiborne and Millers Ferry Locks and Dams Fish Passage - Feasibility Milestone #4 - CWRB December 2023						Project Cost			Project Schedule		
REF	Risk Type	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Likelihood (C)	Impact (C)	Risk Level (C)	Likelihood (S)	Impact (S)	Risk Level (S)	
11	03 - Ability to Execute (AB)	Able to identify NFS	Can the NFS be identified as needed to execute the PPA and secure necessary lands and easements.	NFS for Construction has not been identified. The NFS for feasibility study is non-governmental and numerous discussions have been had by the PDT that a Government agency will be required to be the NFS for construction due to requirements for Real Estate acquisition. It is possible that once authorized, a suitable sponsor is not found and agreements are not approved on normal schedules.	Possible	Marginal	Low	Possible	Critical	High	
12	09 - Environmental & Cultural/Historical Resources (EC)	Cultural Impacts	Could monitoring surveys of environmental sensitivities or cultural resources impact the project?	If additional cultural resources are found this could impact and limit the construction footprint or the borrow sites. This could result in cost and schedule increases. The cost increases could be significant, but the likelihood is unlikely due to the investigations that occurred prior to and during the study.	Possible	Marginal	Low	Possible	Moderate	Medium	
13	Select From List				Unrated	Negligible	#N/A	Unrated	Negligible	#N/A	
14	09 - Environmental & Cultural/Historical Resources (EC)	Environmental Restrictions	Could environmental restrictions change such that they could delay the project or interrupt construction?	There may be a Bald Eagle nesting window. These restriction could increase with time. Bald Eagle restrictions would be January through March, other species could also be identified with work restrictions.	Unlikely	Moderate	Low	Unlikely	Significant	Medium	
15	1 - Project & Program Management (PM)	Change in Design Schedule	A delay in the design schedule could affect design costs & when the contract can be awarded.	The PDT feels confident in the current design schedule which is based on previous similar efforts..	Possible	Negligible	Low	Possible	Marginal	Low	
16	09 - Environmental & Cultural/Historical Resources (EC)	NEPA	Tiered EA	A tiered EA could be necessitated by either redesign or litigation.	Possible	Negligible	Low	Possible	Critical	High	
17	1 - Project & Program Management (PM)	Splitting of projects (PED)	Could the project be split into phases?	Project Locations are remote from each other, but are assumed to be a single project that would be designed together under a single effort. If projects is split into phases or even assigned different efforts there would likely be cost impacts but not schedule impacts (either positive or negative.)	Possible	Marginal	Low	Unrated	Moderate	#N/A	
18	1 - Project & Program Management (PM)	Splitting of projects (Construction)	Could the project be split into phases?	Project Locations are remote from each other, but are assumed to be a single project that would be constructed together under a single contract. If projects is split into phases or even assigned different contracts there would likely be cost impacts and minimal schedule impacts.	Possible	Marginal	Low	Possible	Marginal	Low	
19	12 - Civil/Site Design (CV)	Spoil areas	Has a spoil area been identified and is it nearby?	A potential spoil area has been identified where the cut material can be disposed of. The study assumption is that the necessary land will be available, the only change would be in hauling distance. Due to the large amount of cut materials to be disposed of, changes in hauling distance could have significant cost and schedule impacts.	Likely	Significant	High	Likely	Marginal	Medium	
20	04 - External Risks (EX)	Availability of construction materials or labor force	Concern in getting supplies delivered or availability of workers b/c if delayed it could impact both cost/schedule.	This is currently an issue and it is unknown how this could affect construction of this project when it begins in FY2028. This risk could affect availability of materials, lead times, etc. PDT recognizes this as a risk item but will not model at this time due to the unknowns associated with macroeconomic conditions. Further this risk is at least partially covered by risk #2, 24, 26, 30, and 31. This risk item will be re-visited on subsequent updates.	Unrated	Significant	#N/A	Unrated	Marginal	#N/A	
21	22 - Construction (CO)	Change Orders during Construction	Will change orders be issued during construction that could adjust the cost and schedule of the contract?	Change orders will possibly be issued during construction based on the teams experience with other projects. Changes, if they occur, would likely be the result of other issues identified in the risk register, e.g. environmental requirements or geotechnical conditions. Therefore they are not modeled here to prevent double counting.	Possible	Moderate	Medium	Possible	Moderate	Medium	
22	22 - Construction (CO)	Safety Issues	Could safety incidents occur that would impact the cost and schedule of the contract?	There always exist the possibility of safety incidents occurring on a heavy construction contract, however, typically incidents are not serious and have virtually no effect on price or duration.	Unlikely	Negligible	Low	Unlikely	Negligible	Low	
23	22 - Construction (CO)	Contract Claims	Could there be claims submitted by the contractor that could impact the cost of the contract?	Claims are always a possibility on construction contracts. Like changes in risk #21 claims would likely be the result of other risk identified in this CSRA. Therefore they are not modeled here to prevent double counting. Claims are typically submitted after they occur and should have no impact on the construction schedule.	Possible	Moderate	Medium	Possible	Negligible	Low	

Claiborne and Millers Ferry Locks and Dams Fish Passage - Feasibility Milestone #4 - CWRB December 2023						Project Cost			Project Schedule		
REF	Risk Type	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Likelihood (C)	Impact (C)	Risk Level (C)	Likelihood (S)	Impact (S)	Risk Level (S)	
24	19 - Estimate and Schedule Risks (ES)	Production Estimates	Is production estimate supported by historical contract data and is it dependable for the scope of work in the Recommended Plan?	Production estimates are based off of published averages and estimator's assumptions for the contractors selection of equipment types and quantities. variations in production rates are likely and could have moderate impacts to the price and schedule.	Likely	Moderate	Medium	Likely	Moderate	Medium	
25	19 - Estimate and Schedule Risks (ES)	Fuel Prices	Will there be fuel price increases at the time of the contracts that could impact the cost of the project?	The current annual fuel price trend has been very volatile in the short term for the last several years. Increases or decreases are hard to forecast. Price swings of \$1 down or \$2 up are assumed based on the spread since November 2020.	Likely	Critical	High	Unrated	Negligible	#N/A	
26	19 - Estimate and Schedule Risks (ES)	Labor Cost	Will labor rate increases exceed anticipated rises that could impact the cost of the project.	Alabama is a right-to-work state, but this project could be mandated to use Project Labor Agreements when it is awarded. Recent trends (3 yrs) for labor costs have been about 5% per year. For risk assessment purposes, it is assumed that labor rates could differ from general escalation by between -5% to 10%.	Possible	Moderate	Medium	Unrated	Moderate	#N/A	
27	19 - Estimate and Schedule Risks (ES)	Contract Markups	Could contractor markups exceed the rates used in the construction estimates?	A variety of regional and national contractors are hoped to bid on this job when advertised, minimizing risk of uncompetitive markup rates. Rates used in the estimate are considered to be best available information. Small changes causing little impact are expected, but larger changes are unlikely.	Unlikely	Marginal	Low	Unlikely	Marginal	Low	
28	04 - External Risks (EX)	Court Injunctions	Could the project be challenged in court prior to construction by the public?	Several public comments were received during the study phase that could be interpreted as basis for intent to pursue litigation. Litigation would pause development, but is most likely to occur during the PED phase of implementation.	Unlikely	Negligible	Low	Likely	Critical	High	
29	19 - Estimate and Schedule Risks (ES)	Severe Weather and other Acts of God	Could the project be interrupted by a severe storm system including hurricanes during construction?	The construction sites experience flood conditions nearly every year. The PDT is considering the risk flooding exceeding normal amounts that would delay the project, and could require remobilization.	Likely	Negligible	Low	Likely	Significant	High	
30	19 - Estimate and Schedule Risks (ES)	Material Availability and delivery	Could there be delays due to inadequate delivery of material to the site.	The project will require a lot of steel piles, rip rap and portland cement concrete. Delays in delivery, either because of fabrication or transportation problems could affect the project. As of mid 2023, most Covid induced supply chain issues appear to be resolved, however local, regional, or international incidents could hamper supply as has happened across many sectors in the last few years. due to the uncertainty of this risk, it is not modeled, but is carried forward as a project risk.	Unrated	Moderate	#N/A	Unrated	Moderate	#N/A	
31	04 - External Risks (EX)	Inflation	Could Inflation affect overall price?	The PDT discussed that general inflation could occur during the next few years, as has been experienced in the past few months. This is not apparently captured in CWCCIS. This risk is considered separate from, but similar to the risk associated with fuel prices (Risk 29) and labor prices (Risk 30)	Likely	Critical	High	Unrated	Negligible	#N/A	

## **Appendix C-5**

### **CSRA Assumptions**

## RISK RANGE ASSUMPTION DEVELOPMENT

Risk Matrix						
Likelihood of Occurrence		Impact or Consequence of Occurrence				
		Negligible	Marginal	Moderate	Significant	Critical
	Certain	<b>RELOOK AT BASIS OF ESTIMATE</b>				
	Very Likely	Low	Medium	High	High	High
	Likely	Low	Medium	Medium	High	High
	Possible	Low	Low	Medium	Medium	High
	Unlikely	Low	Low	Low	Medium	Medium

### Likelihood of Occurrence Table

*Any changes to these assumptions will change the assumptions in the models.*

Likelihood	Low % Occurrence	High % Occurrence
<b>Certain</b>	<b>90%</b>	<b>100%</b>
<b>Very Likely</b>	<b>70%</b>	<b>90%</b>
<b>Likely</b>	<b>30%</b>	<b>70%</b>
<b>Possible</b>	<b>5%</b>	<b>30%</b>
<b>Unlikely</b>	<b>0%</b>	<b>5%</b>
<b>Unrated</b>		

*Percent's above are based on 10 events, and are considered approximate, judgment should be used for final grouping dependent on # of occurrences, project size, flexibility and complexity.*

If event occurrence is...	then it's likelihood is thought to be between...
Certain	90% and 100%
Very Likely	70% and 90%
Likely	30% and 70%
Possible	5% and 30%
Unlikely	0% and 5%

### Impact or Consequence of Occurrence

*Any changes to these assumptions will change the assumptions in the models.*

% of Project Cost or Schedule Change		
Likelihood	per Cost Event Exceeds	per Schedule Event Exceeds
<b>Negligible</b>	<b>0.00%</b>	<b>0.00%</b>
<b>Marginal</b>	<b>0.50%</b>	<b>1.00%</b>
<b>Moderate</b>	<b>1.00%</b>	<b>2.00%</b>
<b>Significant</b>	<b>2.00%</b>	<b>3.00%</b>
<b>Critical</b>	<b>3.00%</b>	<b>5.00%</b>

*Percent's above are based on 10 events, and are considered approximate, judgment should be used for final grouping dependent on # of occurrences, project size, flexibility and complexity.*

This sheet defines what the impacts are based on their cost. This is crucial to define what truly negligible, marginal, moderate, etc. are. Fill this out before the meeting so that you can show what the ranges to be concerned are.

Likelihood of Occurrence Tables	
If an event is classified as....	
Certain:	implies the event has a 100% chance of occurrence. Relook at Basis of estimate.
Certain:	implies the event has a 90% to 100% chance of occurrence.
Very Likely:	implies the event has a 70% to 90% chance of occurrence.
Likely:	implies the event has a 30% to 70% chance of occurrence.
Possible:	implies the event has a 5% to 30% chance of occurrence.

If event occurrence is...	then it's Impact to total project cost is thought to be between...
Negligible	0.00% and 0.50%
Marginal	0.50% and 1.00%
Moderate	1.00% and 2.00%
Significant	2.00% and 3.00%
Critical	Over 3.00%

Negligible	0.00% and 1.00%
Marginal	1.00% and 2.00%
Moderate	2.00% and 3.00%
Significant	3.00% and 5.00%
Critical	Over 5.00%

Impact or Consequence of Occurrence	
If an event is classified as....	
Negligible:	implies the event has a 0.00% to 0.50% impact to project cost.
Marginal:	implies the event has a 0.50% to 1.00% impact to project cost.
Moderate:	implies the event has a 1.00% to 2.00% impact to project cost.
Significant:	implies the event has a 2.00% to 3.00% impact to project cost.
Critical:	implies the event has a greater than 3.00% impact to project cost.

Impact or Consequence of Occurrence	
If an event is classified as....	
Negligible:	implies the event has a 0.00% to 1.00% impact to project schedule.
Marginal:	implies the event has a 1.00% to 2.00% impact to project schedule.
Moderate:	implies the event has a 2.00% to 3.00% impact to project schedule.
Significant:	implies the event has a 3.00% to 5.00% impact to project schedule.
Critical:	implies the event has a greater than 5.00% impact to project schedule.

### Impact Percentages Converted to Cost / Schedule Ranges

Impact	Cost Impacts		Schedule Impacts	
	Low Impact	High Impact	Low Impact	High Impact
Negligible	0.00%	0.50%	0.00%	1.00%
Marginal	0.50%	1.00%	1.00%	2.00%
Moderate	1.00%	2.00%	2.00%	3.00%
Significant	2.00%	3.00%	3.00%	5.00%
Critical	3.00%	100.00%	5.00%	100.00%

**Remaining Base Cost / Schedule**

Base Cost	Base Schedule
\$149,488,000	65.00 MO
<b>\$5,000</b>	<b>0.25 MO</b>

<-- Round up to nearest

Impact	Cost Impacts		Schedule Impacts	
	Low Range	High Range	Low Range	High Range
Negligible	\$0	\$750,000	0.00 MO	0.75 MO
Marginal	\$750,000	\$1,495,000	0.75 MO	1.50 MO
Moderate	\$1,495,000	\$2,990,000	1.50 MO	2.00 MO
Significant	\$2,990,000	\$4,485,000	2.00 MO	3.25 MO
Critical	\$4,485,000	∞	3.25 MO	∞

## **Appendix C-6**

### **Risk Register Attendance**

# CSRA Risk Register Meeting Attendance

Claiborne and Millers

Risk Facilitator

## Risk Register Meeting

Date:

Attendance	Name	Office	Role / Discipline
	Allan Annaert		Cost Engineering
	Ken Jackson		Cost Engineering
	Chris Marr		Engineering Technical Lead
	Ashley Throop		H&H
	Johnny Lee		Structural Engineering
	Chase Rourke		Geotech
	Jack Cape		Civil Engineering
	Micah Wiggins		H&H
	Jody Huang		Water Management
	James Hathorne		Water Management
	Jesse Hufstedler		Office of Counsel
	Jonas White		PM
	Derek Kendrick		Operations
	Jason Haynes		Operations/ Resource Manager
	Tonya Harrington		Planner
	Ashley Forwood		Planner
	Stephen Phillips		Econ
	Heather Bulger		Environmental
	TJ Rickey		Environmental
	Alex Smith		Cultural Resources
	Jenny Jacobson		Environmental
	Valerie Powe		Environmental Justice
	Bailey Crane		Planning
	Brenna Mickal		Environmental

## Follow-Up Discussions (Individual or Group Discussions)

Date:  through

Attendance	Name	Office	Role / Discipline



*If Applicable -OR- Available Upon Request*

## **Appendix C-7**

### **Risk Details**

Claiborne and Millers Ferry Lock and Dams Fish Passage Study  
Appendix C

Exhibit C-5: TPCS Sheet for Recommended Plan

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
 PROJECT NO: Alt 5 Bypass Both Dams  
 LOCATION: Monroe and Wilcox Counties, Al

DISTRICT: Mobile District  
 POC: CHIEF, COST ENGINEERING, George Brown  
 PREPARED: 2/23/2024

This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	Program Year (Budget EC): Effective Price Level Date: 2025 1 OCT 24				Spent Thru: 1-Oct-23 (\$K)	TOTAL FIRST COST (\$K)	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
						ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)						
A	B	C	D	E	F	G	H	I	J		K	L	M	N	O
06	Claiborne - Excavation and Haul Off	\$7,157	\$2,147	30.0%	\$9,304	2.7%	\$7,351	\$2,205	\$9,556	\$0	\$9,556	20.5%	\$8,855	\$2,657	\$11,512
06	Claiborne - Rock Lining and Weirs	\$8,441	\$2,532	30.0%	\$10,973	2.7%	\$8,669	\$2,601	\$11,270	\$0	\$11,270	20.5%	\$10,444	\$3,133	\$13,577
06	Claiborne - Dry Island Armoring	\$17,158	\$5,147	30.0%	\$22,305	2.7%	\$17,622	\$5,287	\$22,908	\$0	\$22,908	17.4%	\$20,691	\$6,207	\$26,898
06	Claiborne - Other FOWs	\$7,436	\$2,231	30.0%	\$9,667	2.7%	\$7,637	\$2,291	\$9,928	\$0	\$9,928	17.4%	\$8,967	\$2,690	\$11,657
02	Claiborne - Rec Feature	\$472	\$142	30.0%	\$614	2.7%	\$485	\$145	\$630	\$0	\$630	17.4%	\$569	\$171	\$740
06	Millers Ferry - Excavation and Haul Off	\$23,072	\$6,922	30.0%	\$29,994	2.7%	\$23,696	\$7,109	\$30,805	\$0	\$30,805	20.5%	\$28,546	\$8,564	\$37,110
06	Millers Ferry - Rock Lining and Weirs	\$34,911	\$10,473	30.0%	\$45,384	2.7%	\$35,855	\$10,756	\$46,611	\$0	\$46,611	20.5%	\$43,194	\$12,958	\$56,152
06	Millers Ferry - Fish Deterrent	\$18,123	\$5,437	30.0%	\$23,560	2.7%	\$18,613	\$5,584	\$24,197	\$0	\$24,197	20.5%	\$22,423	\$6,727	\$29,150
06	Millers Ferry - Other FOWs	\$10,362	\$3,109	30.0%	\$13,471	2.7%	\$10,642	\$3,193	\$13,835	\$0	\$13,835	20.5%	\$12,820	\$3,846	\$16,667
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$127,132	\$38,140		\$165,272	2.7%	\$130,569	\$39,171	\$169,740	\$0	\$169,740	19.9%	\$156,509	\$46,953	\$203,462
01	LANDS AND DAMAGES	\$488	\$307	62.9%	\$795	2.6%	\$501	\$315	\$816	\$0	\$816	11.5%	\$558	\$351	\$910
30	PLANNING, ENGINEERING & DESIGN	\$25,036	\$7,511	30.0%	\$32,547	3.6%	\$25,933	\$7,780	\$33,712	\$0	\$33,712	55.2%	\$40,248	\$12,074	\$52,323
31	CONSTRUCTION MANAGEMENT	\$13,349	\$4,005	30.0%	\$17,354	3.6%	\$13,827	\$4,148	\$17,975	\$0	\$17,975	24.5%	\$17,218	\$5,165	\$22,383
<b>PROJECT COST TOTALS:</b>		\$166,005	\$49,962	30.1%	\$215,967		\$170,830	\$51,414	\$222,243	\$0	\$222,243	25.6%	\$214,533	\$64,544	\$279,077

CHIEF, COST ENGINEERING, George Brown

ESTIMATED TOTAL PROJECT COST: **\$279,077**

PROJECT MANAGER, Jonas White

CHIEF, REAL ESTATE, Karen Kennedy

CHIEF, PLANNING, Bailey Crane

CHIEF, ENGINEERING, Jason Krick

CHIEF, OPERATIONS, Nelson Sanchez

CHIEF, CONSTRUCTION, George Condoyiannis

CHIEF, CONTRACTING, Carl Wade

CHIEF, PM-PB, xxxx

CHIEF, DPM, Pete Taylor

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Claiborne and Millers Ferry Locks and Dams Fish Passage Study  
LOCATION: Monroe and Wilcox Counties, AI  
This Estimate reflects the scope and schedule in report; Study Draft Feasibility Report

DISTRICT: Mobile District  
POC: CHIEF, COST ENGINEERING, George Brown

PREPARED: 2/23/2024

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>18-Dec-23</b>		Program Year (Budget EC): 2025		Effective Price Level: 1-Oct-23		Effective Price Level Date: 1 OCT 24						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED			TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)										
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>06</b>	<b>Alabama River Fish Passage</b>													
	Claiborne - Excavation and Haul Off	\$7,157	\$2,147	30.0%	\$9,304	2.7%	\$7,351	\$2,205	\$9,556	2032Q2	20.5%	\$8,855	\$2,657	\$11,512
<b>06</b>	Claiborne - Rock Lining and Weirs	\$8,441	\$2,532	30.0%	\$10,973	2.7%	\$8,669	\$2,601	\$11,270	2032Q2	20.5%	\$10,444	\$3,133	\$13,577
<b>06</b>	Claiborne - Dry Island Armoring	\$17,158	\$5,147	30.0%	\$22,305	2.7%	\$17,622	\$5,287	\$22,908	2031Q2	17.4%	\$20,691	\$6,207	\$26,898
<b>06</b>	Claiborne - Other FOWs	\$7,436	\$2,231	30.0%	\$9,667	2.7%	\$7,637	\$2,291	\$9,928	2031Q2	17.4%	\$8,967	\$2,690	\$11,657
<b>02</b>	Claiborne - Rec Feature	\$472	\$142	30.0%	\$614	2.7%	\$485	\$145	\$630	2031Q2	17.4%	\$569	\$171	\$740
<b>06</b>	Millers Ferry - Excavation and Haul Off	\$23,072	\$6,922	30.0%	\$29,994	2.7%	\$23,696	\$7,109	\$30,805	2032Q2	20.5%	\$28,546	\$8,564	\$37,110
<b>06</b>	Millers Ferry - Rock Lining and Weirs	\$34,911	\$10,473	30.0%	\$45,384	2.7%	\$35,855	\$10,756	\$46,611	2032Q2	20.5%	\$43,194	\$12,958	\$56,152
<b>06</b>	Millers Ferry - Fish Deterrent	\$18,123	\$5,437	30.0%	\$23,560	2.7%	\$18,613	\$5,584	\$24,197	2032Q2	20.5%	\$22,423	\$6,727	\$29,150
<b>06</b>	Millers Ferry - Other FOWs	\$10,362	\$3,109	30.0%	\$13,471	2.7%	\$10,642	\$3,193	\$13,835	2032Q2	20.5%	\$12,820	\$3,846	\$16,667
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$127,132	\$38,140	30.0%	\$165,272		\$130,569	\$39,171	\$169,740			\$156,509	\$46,953	\$203,462
<b>01</b>	LANDS AND DAMAGES	\$488	\$307	62.9%	\$795	2.6%	\$501	\$315	\$816	2029Q2	11.5%	\$558	\$351	\$910
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$300	\$90	30.0%	\$390	3.6%	\$311	\$93	\$404	2029Q2	13.8%	\$354	\$106	\$460
0.0%	Planning & Environmental Compliance	\$1,360	\$408	30.0%	\$1,768	3.6%	\$1,409	\$423	\$1,831	2029Q2	13.8%	\$1,604	\$481	\$2,085
0.0%	Engineering & Design	\$8,900	\$2,670	30.0%	\$11,570	3.6%	\$9,219	\$2,766	\$11,984	2029Q2	13.8%	\$10,495	\$3,149	\$13,644
0.0%	Reviews, ATRs, IEPRs, VE	\$300	\$90	30.0%	\$390	3.6%	\$311	\$93	\$404	2029Q2	13.8%	\$354	\$106	\$460
0.0%	Life Cycle Updates (cost, schedule, risks)	\$120	\$36	30.0%	\$156	3.6%	\$124	\$37	\$162	2029Q2	13.8%	\$142	\$42	\$184
0.0%	Contracting & Reprographics	\$100	\$30	30.0%	\$130	3.6%	\$104	\$31	\$135	2029Q2	13.8%	\$118	\$35	\$153
0.0%	Engineering During Construction	\$200	\$60	30.0%	\$260	3.6%	\$207	\$62	\$269	2032Q2	24.5%	\$258	\$77	\$335
0.0%	Planning During Construction	\$100	\$30	30.0%	\$130	3.6%	\$104	\$31	\$135	2032Q2	24.5%	\$129	\$39	\$168
0.0%	Adaptive Management & Monitoring	\$13,616	\$4,085	30.0%	\$17,701	3.6%	\$14,104	\$4,231	\$18,335	2038Q2	89.7%	\$26,748	\$8,025	\$34,773
0.0%	Project Operations	\$40	\$12	30.0%	\$52	3.6%	\$41	\$12	\$54	2029Q2	13.8%	\$47	\$14	\$61
<b>31</b>	CONSTRUCTION MANAGEMENT													
9.0%	Construction Management	\$11,442	\$3,433	30.0%	\$14,874	3.6%	\$11,852	\$3,556	\$15,407	2032Q2	24.5%	\$14,758	\$4,427	\$19,185
0.0%	Project Operation:	\$0	\$0	30.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.5%	Project Management	\$1,907	\$572	30.0%	\$2,479	3.6%	\$1,975	\$593	\$2,568	2032Q2	24.5%	\$2,460	\$738	\$3,198
	<b>CONTRACT COST TOTALS:</b>	\$166,005	\$49,962		\$215,967		\$170,830	\$51,414	\$222,243			\$214,533	\$64,544	\$279,077