CEDAR BAYOU (Lower Reach)

DMMP, TX

This is Galveston District's Dredged Material Management Plan (DMMP) for maintenance dredging and placement of dredged materials for the lower 5.7 mile portion of Cedar Bayou, Texas. The bayou is a natural stream originating east of Houston in Liberty County, Texas, and forms the boundary between Harris and Chambers Counties. Galveston District has improved and maintains the authorized 5.7 mile channel as a shallow draft channel measuring 10 feet deep at mean low tide (MLT) and 100 feet wide

Per Engineering Regulation (ER) 1105-2-100, Appendix E, all federally maintained navigation projects must demonstrate that there is sufficient dredged material placement capacity for a minimum of 20 years. The remaining authorized placement area (PA), PA 6 has limited capacity and a new PA 7 will need to be constructed.

Quantities and design features were developed by the Galveston District (SWG) Engineering Branch.

This estimate was prepared using MII, Unit Price Books, labor rates, and equipment rates for Region 6, fiscal year 2014 (October 2013). The estimate was divided into 14 contracts, corresponding with the dredging cycles for Cedar Bayou Channel. The midpoint date of the construction contracts were developed in conjunction with the project manager for developing the fully funded costs. The estimate was prepared in accordance with Engineering Regulation (ER) 1110-2-1302, dated September 15, 2008. The costs were escalated in accordance with the above ER and EM 1110-2-1304, dated March 31, 2012. All data was input into the Total Project Cost Summary Sheet (TPCS). The baseline estimate provides for all pertinent elements for a complete project ready for operation.

Since the project cost was under 40 million dollars, an abbreviated risk analysis was performed with the cooperation of the Project Delivery Team in October 2012, revised September 2013. The risks were quantified and a cost risk model developed to determine a contingency. The contingency along with the estimate were used in the TPCS.

ACCOUNT CODE 01 – LANDS AND DAMAGES: Cost for this Account Code was provided by SWG, Real Estate Division.

ACCOUNT CODE 06 – FISH AND WILDLIFE FACILITES (MITIGATION): Preserve the remaining 2.88 acres of march outside footprint of the of the new PA 7, and create new tidal salt marsh by excavating and grading designated locations outside the toe of the PA 7 dike to target marsh elevations. Spartina alterniflora will be planted in the new area at 3-feet on center each way. Quantities and design features were provided by SWG Planning, Environmental, & Regulatory Division. A yearly monitoring and report prepared of the overall condition of plantings and the marsh. This will be done for the next five (5) year after construction.

ACCOUNT CODE 12 – NAVIGATION PORTS AND HARBORS: Dredge quantities were developed by the design engineer. Historically, the channel was dredged using a 24-inch pipeline dredge, which was used for these estimates. The discharged material is to be placed into two (2) PAs, depending upon the channel reach. The Bay Reach is to be placed into the new upland confined PA 7. The Bayou Reach is to be placed into existing PA 6 for the first three (3) maintenance cycles after which time PA 6 will be considered full. Thereafter, the Bayou Reach maintenance material is to be placed into PA 7. Continued maintenance of this project requires a dredge to excavate and deposit maintenance material into PAs on an average cycle of once every five (5) years. It is estimated that approximately two (2) million cubic yards will be dredged in a 20-year period.

The dredging costs were developed using CEDEP. The dredge production rates were based on historical records for dredging the area. The costs for mobilization and demobilization were developed using CEDEP, assuming the dredges were based in New Orleans. The dredge estimates were based on standard operation practices for the Galveston District, which assumed conventional contractual practices of large business invitation for bids (IFBs').

The cost for creating a new PA 7 was included under this code of account. The levee footprint and proposed borrow areas are to be cleared of vegetations and existing infrastructures. The levee will be constructed using 3-cubic yard (CY) dragline buckets, with an optimal production rate of 110 Cy/Hour. A total of two (2) draglines will be working at the same time. Construction of the levee will consist of borrowing materials from the inside perimeter of PA. The levee will be constructed in 12-inch lifts using a bull-dozer for semi-compaction. The final crown and outside slope of the levee will be seeded using the hydro-mulch method. Material characteristics were provided by Engineering Division, Structural and Geotechnical Section.

An effluent drop-outlet structure will be constructed at the north end of PA 7 with discharge into Cedar Bayou. The PA 7 is constructed on what was previously developed for a recreational vehicle park. Existing infrastructure within the site includes asphalt surfaced roads and underground utilities, including storm and sanitary sewers and water distribution pipes. Exposed ends of storm sewers are to be grouted and the sanitary sewer and water pipes are to be capped prior to levee construction. Existing canals located at the north end of PA 7 and connected to Cedar Bayou will be used for burial of debris. The levee will be constructed across the canals, prior to use.

PA 6 is to be reconfigured within the existing footprint, including moving the discharge drop-outlet box from the southeast to the northwest corner of the site and removing the existing training levee.

ACCOUNT CODE 30 – ENGINEERING AND DESGIN: The cost for this account was developed using the guidelines provided in the TPCS, with the agreement of the cost engineer and the project manager.

ACCOUNT CODE 31 – CONSTRUCTION MANAGEMENT: The cost for this account was developed using the guidelines provided in the TPCS, with the agreement of the cost engineer and the project manager.

Cedar Bayou (Lower Reach) DMMP, Houston, TX
Channel 10 + 2 +2
Houston, Texas
October 2012 Price Level

Estimated by	J. Lockhart
Designed by	CESWG-EC-PS
Prepared by	U.S. Army Corps of Engineers - Galveston District
Preparation Date	3/4/2013
Effective Date of Pricing	3/4/2013
Estimated Construction Time	Days

Description	UOM	Quantity	ProjectCost
Project Cost Summary Report			**16,566,102**
01 FY 2015 - Contract 1	**LS**	**1.00**	**3,093,934**
0102 Federal Costs	**LS**	**1.00**	**3,093,934**
010206 Fish and Wildlife Facilities	**LS**	**1.00**	**226,223**
010212 Navigation Ports and Harbors	**LS**	**1.00**	**2,867,711**
02 FY2015 - Contract 2	**LS**	**1.00**	**634,184**
0202 Federal Costs	**LS**	**1.00**	**634,184**
020212 Navigation Ports and Harbors	**LS**	**1.00**	**634,184**
03 FY2016 - Contract 3	**LS**	**1.00**	**3,366,850**
0302 Federal Costs	**LS**	**1.00**	**3,366,850**
030212 Navigation Ports & Harbors	**LS**	**1.00**	**3,359,246**
030206 Fish and Wildlife Facilities	**LS**	**1.00**	**7,605**
04 FY 2017 - Contract 3.5	**EA**	**1.00**	**7,605**
0406 Fish and Wildlife Facilities	**LS**	**1.00**	**7,605**
040601 Spartina Intertidal Marsh - Monitoring	**LS**	**1.00**	**7,605**
05 FY 2018 - Contract 4	**LS**	**1.00**	**481,658**
0502 Federal Costs	**LS**	**1.00**	**481,658**
050212 Navigation Ports and Harbors	**LS**	**1.00**	**474,054**
050206 Fish and Wildlife Facilities	**LS**	**1.00**	**7,605**
06 FY2019 - Contract 5	**LS**	**1.00**	**501,094**
0602 Federal Costs	**LS**	**1.00**	**501,094**
060212 Navigation Ports and Harbors	**LS**	**1.00**	**493,489**
060206 Fish and Wildlife Facilities	**LS**	**1.00**	**7,605**
07 FY 2020 - Contract 5.5	**EA**	**1.00**	**7,605**
0706 Fish and Wildlife Facilities	**LS**	**1.00**	**7,605**
0601 Spartina Intertidal Marsh - Monitoring	**LS**	**1.00**	**7,605**

Description	UOM	Quantity	ProjectCost
08 FY2021 - Contract 6	LS	1.00	2,258,217
0802 Federal Costs	LS	1.00	2,258,217
080212 Navigation Ports & Harbors	LS	1.00	2,258,217
09 FY 2023 - Contract 7	LS	1.00	474,054
0902 Federal Costs	LS	1.00	474,054
090212 Navigation Ports and Harbors	LS	1.00	474,054
10 FY2024 - Contact 8	LS	1.00	493,489
1002 Federal Costs	LS	1.00	493,489
100212 Navigation Ports and Harbors	LS	1.00	493,489
11 FY2026 - Contract 9	LS	1.00	2,212,771
1102 Federal Costs	EA	1.00	2,212,771
110212 Navigation Ports & Harbors	LS	1.00	2,212,771
12 FY 2028 - Contract 10	LS	1.00	275,342
1202 Federal Costs	LS	1.00	275,342
120212 Navigation Ports and Harbors	LS	1.00	275,342
13 FY2029 - Contract 11	LS	1.00	124,244
1302 Federal Costs	LS	1.00	124,244
130212 Navigation Ports and Harbors	LS	1.00	124,244
14 FY2031 - Contract 12	LS	1.00	2,258,217
1402 Federal Costs	LS	1.00	2,258,217
140212 Navigation Ports & Harbors	LS	1.00	2,258,217
15 FY 2033 - Contract 13	LS	1.00	275,342
1502 Federal Costs	LS	1.00	275,342
150212 Navigation Ports and Harbors	LS	1.00	275,342
16 FY2034 - Contract 14	LS	1.00	101,497
1602 Federal Costs	LS	1.00	101,497

Description	UOM	Quantity	ProjectCost
160212 Navigation Ports and Harbors	**LS**	**1.00**	**101,497**

Description **Page**

Abbreviated Risk Analysis

Cedar Bayou (Lower Reach) , TX DMMP
Feasibility (Recommended Plan)

Meeting Date: Original: 10/19/2012 Revised 9/24/2013

PDT Members

Note: PDT involvement is commensurate with project size and involvement.

Cost Engineer	Jackie Lockhart
Cost Engineer	Dale Williams
Geotech:	Brad Boothby
PM	MAJ Couturier
Real Estate:	Vinh Nguyen
Operations:	Paula Wise
Civil Engineer	Jose D. Castro
Environmental Lead	Jerry Androy
Planning Lead	T. Cheryl Jaynes
Ch Professional Services	Willie Joe Honza
Real Estate:	Kenneth Pablo
H&H Lead	Samantha Lambert
Environmental Lead	Andrea Catanzaro

Abbreviated Risk Analysis

Project (less than $40M): **Cedar Bayou (Lower Reach) , TX DMMP FY 16 to FY 34**
Project Development Stage: **Feasibility (Recommended Plan)**
Risk Category: **Low Risk: Simple Project-No Life Safety**

Total Construction Contract Cost = **$ 11,447,379**

	CWWBS	Feature of Work	Contract Cost	% Contingency	$ Contingency	Total
1	12 NAVIGATION, PORTS AND HARBORS	**Dredge Main Ch (cont 3,6,9, & 12)**	$ 8,063,659	22.42%	$ 1,807,485	$ 9,871,144.38
2	12 NAVIGATION, PORTS AND HARBORS	**Dewater PA's (contr 4,7,10, & 13)**	$ 1,498,792	20.43%	$ 306,274	$ 1,805,066.29
3	12 NAVIGATION, PORTS AND HARBORS	**Levee Rehab PA 6 (contr 2, 5, & 8)**	$ 1,372,674	22.26%	$ 305,493	$ 1,678,166.81
4	12 NAVIGATION, PORTS AND HARBORS	**Levee Rehab PA 7 (contr 5,8,11,&14)**	$ 474,229	16.16%	$ 76,650	$ 550,879.04
5	06 FISH AND WILDLIFE FACILITIES	**Mitigation Feature Monitoring**	$ 38,025	10.44%	$ 3,971	$ 41,995.95
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ -	0.00%	$ -	$ -
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ -	0.00%	$ -	$ -

Totals					
Total Construction Estimate	$ 11,447,379	21.84%	$ 2,499,873	$ 13,947,252
Total Planning, Engineering & Design	$ -	0.00%	$ -	$ -
Total Construction Management	$ -	0.00%	$ -	$ -
Total	$ 11,447,379		$ 2,499,873	$ 13,947,252

Cedar Bayou (Lower Reach) , TX DMMP FY 16 to FY 34
Feasibility (Recommended Plan)
Abbreviated Risk Analysis

Meeting Date: Original :10/19/2012 Revised 9/24/2013

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope Growth							
					Max Potential Cost Growth		40%
PS-1	Dredge Main Ch (cont 3,6,9, & 12)	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	Shoaling rates are unpredictable and cannot be precisely determined. In the context of this channel. Sea level rise will result in a deeper water column thereby potentially resulting in fewer maintenance cycles.	Possible	Significant	2
PS-2	Dewater PA's (contr 4,7,10, & 13)	• Water care and diversion fully understood, planned?	• Water care and diversion fully understood, planned?	The drying time between the dredging and commencement of dewatering. So sufficient time needs to exits between the end of dredging and the commencement of dewater. Otherwise the cost will grow due to difficulty of the work area. The effectiveness of the dewatering will also be affected because the ditches will not be as deep.	Possible	Significant	2
PS-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Potential for scope growth, added features and quantities?	• Investigations sufficient to support design assumptions? • Potential for scope growth, added features and quantities?	Is there sufficient geotech information available to do the required design? There is an unexpected increase in dredging quantities, resulting in a need for increase in the PA capacity. Which would result in increase in levee high.	Possible	Significant	2
PS-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	If there is an unexpected increase in the dredging quantities, resulting in a need for increase in the PA capacity. Which would result in increase in levee height.	Unlikely	Negligible	0
PS-5	Mitigation Feature Monitoring	• Project accomplish intent?	• Project accomplish intent?	Monitoring the plantings will determine whether the intent for the mitigation was accomplished.	Unlikely	Negligible	0
PS-13	Planning, Engineering, & Design	• Project accomplish intent?	• Project accomplish intent?	There is assumed to be no additional design required for the containment dikes or the channel to be dredged.	Unlikely	Negligible	0
PS-14	Construction Management	• Project accomplish intent?	• Project accomplish intent?	The scope of the project is very standard for SWG and therefore will require the same amount of construction management as previous projects.	Unlikely	Negligible	0

Acquisition Strategy

					Max Potential Cost Growth		30%
AS-1	Dredge Main Ch (cont 3,6,9, & 12)	• Contracting plan firmly established?	• Contracting plan firmly established?	Cost are based on a firmly established procurement methodology. The contracting plan for dredging contracts is normally full and open bidding resulting in award to a large business.	Likely	Negligible	1
AS-2	Dewater PA's (contr 4,7,10, & 13)	• Requirement for subcontracting?	• Contracting plan firmly established? • Limited bid competition anticipated? • 8a or small business likely?	8a or subcontract work and limited completion due to the nature of the work, and equipment involved in dewatering the site.	Likely	Marginal	2
AS-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Bid schedule developed to reduce quantity risks?	• 8a or small business likely? • Requirement for subcontracting? • Accelerated schedule or harsh weather schedule? • Bid schedule developed to reduce quantity risks?	Due to the nature of work it would be hard to not go small business. This work could be added to the dredging contract. The work is weather dependent. The government would want to reduce risk of cost overrun by going LS rather that unit price.	Likely	Marginal	2
AS-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Bid schedule developed to reduce quantity risks?	• 8a or small business likely? • Requirement for subcontracting? • Accelerated schedule or harsh weather schedule? • Bid schedule developed to reduce quantity risks?	Due to the nature of work it would be hard to not go small business. This work could be added to the dredging contract. The work is weather dependent. The government would want to reduce risk of cost overrun by going LS rather that unit price.	Likely	Marginal	2
AS-5	Mitigation Feature Monitoring	• Contracting plan firmly established?	• Contracting plan firmly established?	Cost are based on a firmly established procurement methodology.	Unlikely	Negligible	0
AS-13	Planning, Engineering, & Design	• Contracting plan firmly established?	• Contracting plan firmly established?	Cost are based on a firmly established procurement methodology. The contracting plan for dredging contracts is normally full and open bidding resulting in award to a large business.	Likely	Negligible	1
AS-14	Construction Management	• 8a or small business likely?	• 8a or small business likely?	An increase in work could occur due to the possibility of this being a small business contract. An increase in oversight of the contractor could occur.	Possible	Negligible	0

Construction Elements

					Max Potential Cost Growth		15%
CE-1	Dredge Main Ch (cont 3,6,9, & 12)	• Potential for construction modification and claims?	• Potential for construction modification and claims?	The dredging for this project is of maintenance material. This type of project is a very regular occurrence in this district. The biggest risk associated with this item is quantity overrun. There should not be any complexity in the dredging of the channel.	Possible	Marginal	1
CE-2	Dewater PA's (contr 4,7,10, & 13)	• Unique construction methods?	• Accelerated schedule or harsh weather schedule? • Unique construction methods?	This work is weather dependent, it requires unique equipment to perform the job. i.e. "marsh buggy's".	Possible	Marginal	1
CE-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Potential for construction modification and claims?	• Accelerated schedule or harsh weather schedule? • Potential for construction modification and claims?	Work is weather dependent. There's a chance on a construction mods and claim if the contractor finds different site conditions.	Possible	Marginal	1
CE-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Potential for construction modification and claims?	• Accelerated schedule or harsh weather schedule? • Potential for construction modification and claims?	Work is weather dependent. There's a chance on a construction mods and claim if the contractor finds different site conditions.	Unlikely	Negligible	0
CE-5	Mitigation Feature Monitoring	• Special equipment or subcontractors needed?	• Special equipment or subcontractors needed?	Access maybe restricted to water, which could increase the cost for doing the data collection	Possible	Marginal	1
CE-13	Planning, Engineering, & Design	• Accelerated schedule or harsh weather schedule?	• Accelerated schedule or harsh weather schedule?	Most of the work on this project has been completed on different projects in the past. The knowledge of how to manage these tasks is readily available.	Unlikely	Marginal	0
CE-14	Construction Management	• Accelerated schedule or harsh weather schedule?	• Accelerated schedule or harsh weather schedule?	Most of the work on this project has been completed on different projects in the past. The knowledge of how to manage these tasks is readily available.	Unlikely	Negligible	0

Quantities for Current Scope

					Max Potential Cost Growth		20%
Q-1	Dredge Main Ch (cont 3,6,9, & 12)	• Level of confidence based on design and assumptions?	• Level of confidence based on design and assumptions?	A delay in the construction start could result in a quantity bust. The dredge quantity could increase form the bid quantity. Dredge surveys prior to bid opening need to be current.	Possible	Significant	2
Q-2	Dewater PA's (contr 4,7,10, & 13)	• Level of confidence based on design and assumptions?	• Level of confidence based on design and assumptions?	Quantities not a issue for dewatering, standard calculation methodology. The difficulty results for the type of material being handled and if the contractor needs to do additional passes.	Unlikely	Negligible	0
Q-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Level of confidence based on design and assumptions?	• Level of confidence based on design and assumptions?	Type of material and cut to fill ratios will affect the quantity calculations. The use of the LS will increase the risk on the contractor.	Possible	Marginal	1
Q-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Level of confidence based on design and assumptions?	• Level of confidence based on design and assumptions?	Type of material and cut to fill ratios will affect the quantity calculations. The use of the LS will increase the risk on the contractor.	Possible	Marginal	1
Q-5	Mitigation Feature Monitoring	• Level of confidence based on design and assumptions?			Unlikely	Negligible	0
Q-13	Planning, Engineering, & Design	• Level of confidence based on design and assumptions?	• Possibility for increased quantities due to loss, waste, or subsidence? • Level of confidence based on design and assumptions?	Survey data for maintenance dredging must be as current as possible. There will need to be surveys prior to award of the contract.	Possible	Negligible	0
Q-14	Construction Management	• Possibility for increased quantities due to loss, waste, or subsidence?	• Possibility for increased quantities due to loss, waste, or subsidence?	Survey data for maintenance dredging must be as current as possible. There will need to be surveys prior to award of the contract.	Possible	Negligible	0

Specialty Fabrication or Equipment

					Max Potential Cost Growth		50%
FE-1	Dredge Main Ch (cont 3,6,9, & 12)	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does not have any specialty equipment. It is very standard dredging.	Unlikely	Negligible	0
FE-2	Dewater PA's (contr 4,7,10, & 13)	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does have specialty equipment (marsh buggy's). But the contractor either has it or will rent it.	Unlikely	Negligible	0
FE-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does not have any specialty equipment. It is very standard construction.	Unlikely	Negligible	0
FE-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does not have any specialty equipment. It is very standard construction.	Unlikely	Negligible	0
FE-5	Mitigation Feature Monitoring	• Unusual parts, material or equipment manufactured or installed?	N/A	N/A	Unlikely	Negligible	0
FE-13	Planning, Engineering, & Design	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does not have any specialty equipment. It is very standard construction.	Unlikely	Marginal	0
FE-14	Construction Management	• Unusual parts, material or equipment manufactured or installed?	• Unusual parts, material or equipment manufactured or installed?	This portion of work does not have any specialty equipment. It is very standard construction.	Unlikely	Negligible	0

Cost Estimate Assumptions

						Max Potential Cost Growth	25%
CT-1	Dredge Main Ch (cont 3,6,9, & 12)	• Site accessibility, transport delays, congestion?	• Site accessibility, transport delays, congestion?	Dredge assumed to mob/demob from New Orleans. No possible conflict with other dredging in the area. Therefore no negligible risk factor.	Unlikely	Marginal	0
CT-2	Dewater PA's (contr 4,7,10, & 13)	• Site accessibility, transport delays, congestion?	• Site accessibility, transport delays, congestion?	Land access is available for both PA's, equipment would probably brought in as oversized loads. The equipment could also be barged in.	Likely	Marginal	2
CT-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Site accessibility, transport delays, congestion?	• Site accessibility, transport delays, congestion?	Land access is available for both PA's, equipment would probably brought in as oversized loads. The equipment could also be barged in.	Likely	Marginal	2
CT-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Site accessibility, transport delays, congestion?	• Site accessibility, transport delays, congestion?	Land access is available for both PA's, but equipment would probably be brought in as oversized loads. The equipment could also be barged in.	Likely	Marginal	2
CT-5	Mitigation Feature Monitoring	• Site accessibility, transport delays, congestion?	• Site accessibility, transport delays, congestion?	Site accessibility may only be by water, increasing the cost for collecting the data.	Possible	Marginal	1
CT-13	Planning, Engineering, & Design	• Reliability and number of key quotes?	N/A	N/A	Unlikely	Negligible	0
CT-14	Construction Management	• Reliability and number of key quotes?	N/A	N/A	Unlikely	Negligible	0

External Project Risks

						Max Potential Cost Growth	20%
EX-1	Dredge Main Ch (cont 3,6,9, & 12)	• Potential for market volatility impacting competition, pricing?	• Unanticipated inflations in fuel, key materials? • Potential for market volatility impacting competition, pricing?	Fuel prices are subject to frequent change and could rise dramatically in a short period of time.	Likely	Significant	3
EX-2	Dewater PA's (contr 4,7,10, & 13)	• Potential for severe adverse weather?	• Potential for severe adverse weather?	Work is very weather dependent , and an unforeseen "wet" season would severally impact the contractors ability to perform the work.	Possible	Marginal	1
EX-3	Levee Rehab PA 6 (contr 2, 5, & 8)	• Potential for severe adverse weather?	• Potential for severe adverse weather?	Adverse weather could serious delay the contractors completion of the work.	Possible	Marginal	1
EX-4	Levee Rehab PA 7 (contr 5,8,11,&14)	• Potential for severe adverse weather?	• Potential for severe adverse weather?	Adverse weather could seriously delay the contractors completion of the work.	Possible	Marginal	1
EX-5	Mitigation Feature Monitoring	• Unanticipated inflations in fuel, key materials?	• Unanticipated inflations in fuel, key materials?	Assume additional plants may need to be purchased, and the cost for the plants could increase.	Possible	Marginal	1
EX-13	Planning, Engineering, & Design	• Potential for severe adverse weather?	• Potential for severe adverse weather?	There is a possibility for re-design due to storms damaging the construction efforts.	Unlikely	Marginal	0
EX-14	Construction Management	• Potential for severe adverse weather?	• Potential for severe adverse weather?	Possibility for increase in construction management due to mods occurring to repair work that has already been completed from hurricane damage.	Unlikely	Marginal	0

WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. P2 369659

SWG CEDAR BAYOU (Lower Reach), TX – DMMP (10+2+2)

The Cedar Bayou Lower Reach DMMP project, as presented by Galveston District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of October 1, 2013, the Cost MCX certifies the estimated total project cost of:

FY 2014 CG Price Level:	$8,924,000 Construction General
Fully Funded Amount:	$9,121,000 Construction General

FY 2014 DMMP O&M:	$19,521,000 O&M
Fully Funded (2015-34):	$24,393,000 O&M

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management throughout the life of the project.

CALLAN.KIM.C
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Date: 2013.10.01 11:12:04 -07'00'

Kim C. Callan, PE, CCE, PM
Chief, Cost Engineering MCX
Walla Walla District

US Army Corps of Engineers®

PROJECT: P2 369659 - Cedar Bayou (Lower Reach), TX - DMMP (10+2+2)
LOCATION: Houston, TX
DISTRICT: SWG - Galveston
PREPARED: 9/26/2013
POC: CHIEF, COST ENGINEERING, Willie Joe Honza P.E.

This Estimate reflects the scope and schedule in report; DMMP

SUMMARY OF CONSTRUCTION GENERAL COSTS

WBS NUMBER	Civil Works Feature & Sub-Feature Description	BASE COST COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	PROJECT 1ST COST (CONSTANT DOLLAR) FY: 2014 ESC (%)	COST ($K)	CNTG ($K)	EPL: 1 OCT 13 FIRST COST TOTAL ($K)	Spent Thru: 1-Oct-12 ($K)	L	TOTAL PROJECT COST (FULLY FUNDED) COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
12	NAVIGATION PORTS & HARBORS	$2,868	$660	22%	$3,528	2.1%	$2,927	$673	$3,600			$3,009	$692	$3,701
06	FISH & WILDLIFE FACILITIES	$226	$57	22%	$278	2.1%	$231	$53	$284			$237	$55	$292
	CONSTRUCTION ESTIMATE TOTALS:	$3,094	$717		$3,806		$3,158	$726	**$3,884**			$3,246	$747	$3,993
01	LANDS AND DAMAGES	$3,351	$771	23%	$4,122	2.1%	$3,420	$787	**$4,207**			$3,466	$797	$4,263
30	PLANNING, ENGINEERING & DESIGN	$542	$125	23%	$667	1.8%	$551	$127	**$678**			$569	$131	$700
31	CONSTRUCTION MANAGEMENT	$124	$29	23%	$153	1.8%	$126	$29	**$155**			$134	$31	$164
	PROJECT COST TOTALS:	$7,111	$1,641	23%	$8,747		$7,255	$1,669	**$8,924**			$7,415	$1,706	$9,121

ESTIMATED FEDERAL COST:	48%	**$4,372**
ESTIMATED NON-FEDERAL COST:	52%	**$4,749**
ESTIMATED TOTAL PROJECT COST:		**$9,121**

FUTURE FULLY FUNDED O&M (FY2015-2034): **$24,394**

CHIEF, COST ENGINEERING, Willie Joe Honza P.E.

PROJECT MANAGER, Denise Thomas

CHIEF, REAL ESTATE, Orlando Rosa

CHIEF, PLANNING, Environmental, and Regulatory, Dolan Dunn

CHIEF, ENGINEERING, Joe King R.A.

CHIEF, OPERATIONS, Joe Hrametz P.E.

CHIEF, CONSTRUCTION, Don Carelock P.E.

CHIEF, CONTRACTING, Kathy Freeman

CHIEF, PM-J, William Wise P.E.

CHIEF, DPM, Pete G. Perez P.E.

**** CONTRACT COST SUMMARY ****

PROJECT: P2 369659 - Cedar Bayou (Lower Reach), TX - DMMP (10+2+2)
LOCATION: Houston, TX
This Estimate reflects the scope and schedule in report; DMMP

DISTRICT: SWG - Galveston PREPARED: 9/26/2013
POC: CHIEF, COST ENGINEERING, Willie Joe Honza P.E.

WBS NUMBER	Civil Works Feature & Sub-Feature Description	Estimate Prepared: 4-Mar-13 COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	Program Year (Budget EC): 2014 ESC (%)	COST ($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
	Contract 1 - FY2015 CONSTRUCTION GENERAL													
06	FISH & WILDLIFE FACILITIES	$226	$52	23%	$278	2.1%	$231	$53	$284	2015Q3	2.8%	$237	$55	$292
12	NAVIGATION PORTS & HARBORS	$2,868	$660	23%	$3,528	2.1%	$2,927	$673	$3,600	2015Q3	2.8%	$3,009	$692	$3,701
	CONSTRUCTION ESTIMATE TOTALS:	$3,094	$712	23%	**$3,806**		$3,158	$726	$3,884			$3,246	$747	$3,993
01	LANDS AND DAMAGES	$3,351	$771	23%	$4,122	2.1%	$3,420	$787	$4,207	2014Q4	1.3%	$3,466	$797	$4,263
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	$15	$3	23%	$18	1.8%	$15	$4	$19	2014Q4	2.6%	$16	$4	$19
0.5%	Planning & Environmental Compliance	$15	$3	23%	$18	1.8%	$15	$4	$19	2014Q4	2.6%	$16	$4	$19
10.0%	Engineering & Design	$309	$71	23%	$380	1.8%	$314	$72	$387	2014Q4	2.6%	$323	$74	$397
1.0%	Engineering Tech Review ITR & VE	$31	$7	23%	$38	1.8%	$32	$7	$39	2014Q4	2.6%	$32	$7	$40
	Real Estate In-House Labor	$33	$8	23%	$41	1.8%	$34	$8	$41	2014Q4	2.6%	$34	$8	$42
1.0%	Contracting & Reprographics	$31	$7	23%	$38	1.8%	$32	$7	$39	2014Q4	2.6%	$32	$7	$40
1.0%	Engineering During Construction	$31	$7	23%	$38	1.8%	$32	$7	$39	2015Q3	5.8%	$33	$8	$41
0.5%	Life Cycle Update Cost, schedule, risk	$15	$3	23%	$18	1.8%	$15	$4	$19	2015Q3	5.8%	$16	$4	$20
2.0%	Project Operations	$62	$14	23%	$76	1.8%	$63	$15	$78	2014Q4	5.8%	$67	$15	$82
31	CONSTRUCTION MANAGEMENT													
3.0%	Construction Management	$93	$21	23%	$114	1.8%	$95	$22	$116	2015Q3	5.8%	$100	$23	$123
1.0%	Project Operation: Project Management	$31	$7	23%	$38	1.8%	$32	$7	$39	2015Q3	5.8%	$33	$8	$41
	CONTRACT COST TOTALS:	$7,111	$1,636	23.0%	$8,747		$7,255	$1,669	$8,924	2015Q3	2.2%	$7,415	$1,706	**$9,121**

PROJECT: **CEDAR BAYOU DMMP (Lower Reach) TX (10+2+2)** SWG - Galveston PREPARED: 9/26/2013
LOCATION: **Houston, TX** CHIEF, COST ENGINEERING, Willie Joe Honza P.E.

DMMP

Civil Works Feature & Sub-Feature Description	COST ($K)	EFF PRICE LEVEL: CNTG ($K)	CNTG (%)	1-Oct-12 2013	CONSTANT DOLLAR TOTAL 2014 ($K)	MID-PT CONSTRUCTION	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
CG PROJECT COST TOTALS:	$7,111	$1,641	23.1%	$8,752	**$8,924**			$7,415	$1,706	**$9,121**
O&M PROJECT COST TOTALS:	$15,711	$3,425	21.8%	$19,136	**$19,521**			$20,027	$4,366	**$24,393**
Contract 1 - FY2015 CONSTRUCTION GENERAL										
COST TOTALS:	$7,111	$1,636	23.0%	$8,747	**$8,924**	2015Q3	2.2%	$7,415	$1,706	**$9,121**
Contract 2 - FY2015 O&M										
COST TOTALS:	$759	$165	21.8%	$924	**$943**	2015Q4	3.7%	$803	$175	**$977**
Contract 3 - FY 2016 O&M										
COST TOTALS:	$3,492	$761	21.8%	$4,253	**$4,340**	2016Q2	4.4%	$3,721	$811	**$4,532**
Contract 3.5 - FY 2017 O&M										
COST TOTALS:	$8	$2	21.8%	$10	**$10**	2017Q2	6.2%	$8	$2	**$10**
Contract 4 - FY 2018 O&M										
COST TOTALS:	$578	$126	21.8%	$704	**$718**	2018Q4	10.9%	$654	$143	**$796**
Contract 5 - FY 2019 O&M										
COST TOTALS:	$603	$131	21.8%	$734	**$749**	2019Q3	13.1%	$696	$152	**$847**
Contract 5.5 - FY 2020 O&M										
COST TOTALS:	$8	$2	21.8%	$10	**$10**	2020Q2	12.4%	$9	$2	**$11**
Contract 6 - FY 2021 O&M										
COST TOTALS:	$2,711	$591	21.8%	$3,302	**$3,368**	2021Q2	17.8%	$3,257	$710	**$3,966**
Contract 7 - FY 2023 O&M										
COST TOTALS:	$568	$124	21.8%	$692	**$706**	2023Q4	24.7%	$723	$158	**$880**
Contract 8 - FY 2024 O&M										
COST TOTALS:	$617	$135	21.8%	$752	**$767**	2024Q3	28.2%	$807	$176	**$983**
Contract 9 - FY 2026 O&M										
COST TOTALS:	$2,654	$579	21.8%	$3,233	**$3,297**	2026Q2	32.7%	$3,592	$783	**$4,375**
Contract 10 - FY 2028 O&M										
COST TOTALS:	$358	$78	21.8%	$436	**$445**	2028Q4	44.4%	$527	$115	**$642**
Contract 11 - FY 2029 O&M										
COST TOTALS:	$161	$35	21.8%	$196	**$200**	2029Q3	47.7%	$243	$53	**$295**
Contract 12 - FY 2031 O&M										
COST TOTALS:	$2,711	$591	21.8%	$3,302	**$3,368**	2031Q2	50.7%	$4,167	$908	**$5,075**
Contact 13 - FY 2033 O&M										
COST TOTALS:	$344	$75	21.8%	$419	**$427**	2033Q4	63.9%	$575	$125	**$701**
Contract 14 - FY 2034 O&M										
COST TOTALS:	$139	$30	21.8%	$169	**$173**	2034Q3	74.8%	$248	$54	**$302**