Appendix L

ABREVIATED RISK ANALYSIS

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1A 15-Adjacent**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 507,730,622**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ -		0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 507,730,622		25.22%	$ 128,069,627	$ 635,800,249
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 50,773,062		7.00%	$ 3,554,114	$ 54,327,177
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 40,618,450		7.00%	$ 2,843,291	$ 43,461,741
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 507,730,622		25.22%	$ 128,069,627	$ 635,800,249
Total Planning, Engineering & Design	$ 50,773,062		7.00%	$ 3,554,114	$ 54,327,177
Total Construction Management	$ 40,618,450		7.00%	$ 2,843,291	$ 43,461,741
Total	**$ 599,122,134**		**22%**	**$ 134,467,033**	**$ 733,589,167**

	Base	**50%**	**80%**
Range Estimate ($000's)	$599,122k	$679,802k	$733,589k

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

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

Houma Navigation Canal Deepening Project 1A 15-Adjacent

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Negligible	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
PS-14	Construction Management			Negligible	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Negligible	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Negligible	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Negligible	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		20%
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1A 15-Adjacent
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$507,731
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$50,773
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$40,618
									$599,122
Risk		$ 10,618	$ 10,024	$ 50,665	$ 16,828	$ 11,103	$ 18,400	$ 16,828	**$134,467**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 10,618	$ 10,024	$ 50,665	$ 16,828	$ 11,103	$ 18,400	$ 16,828	**$134,467**
								Total	**$733,589**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1A 18-Adjacent**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 103,352,500**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 14,201,300		23.25%	$ 3,301,121	$ 17,502,421
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 87,139,127		32.02%	$ 27,898,686	$ 115,037,813
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	**$ 2,012,073**	*2.0%*	0.00%	$ -	$ 2,012,073
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 10,335,250		16.15%	$ 1,668,740	$ 12,003,990
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 8,268,200		16.15%	$ 1,334,992	$ 9,603,192
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 103,352,500	30.19%	$ 31,199,807	$ 134,552,307	
Total Planning, Engineering & Design	$ 10,335,250	16.15%	$ 1,668,740	$ 12,003,990	
Total Construction Management	$ 8,268,200	16.15%	$ 1,334,992	$ 9,603,192	
Total	**$ 121,955,950**	**28%**	**$ 34,203,539**	**$ 156,159,489**	

	Base	**50%**	**80%**
Range Estimate ($000's)	$121,956k	$142,478k	$156,159k

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

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

Houma Navigation Canal Deepening Project 1A 18-Adjacent

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		20%
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1A 18-Adjacent
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$14,201
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$87,139
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$2,012
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$10,335
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$8,268
									$121,956
Risk		$ 5,809	$ 2,001	$ 11,390	$ 3,147	$ 2,216	$ 6,282	$ 3,359	**$34,204**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 5,809	$ 2,001	$ 11,390	$ 3,147	$ 2,216	$ 6,282	$ 3,359	**$34,204**
								Total	**$156,159**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1A 18-Adjacent**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 512,947,174**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ -		0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 512,947,174		25.22%	$ 129,385,446	$ 642,332,620
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	Remaining Construction Items	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	$ 51,294,717		7.00%	$ 3,590,630	$ 54,885,348
14	31 CONSTRUCTION MANAGEMENT	Construction Management	$ 41,035,774		7.00%	$ 2,872,504	$ 43,908,278
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals				
Real Estate	$ -	0.00%	$ -	$ -
Total Construction Estimate	$ 512,947,174	25.22%	$ 129,385,446	$ 642,332,620
Total Planning, Engineering & Design	$ 51,294,717	7.00%	$ 3,590,630	$ 54,885,348
Total Construction Management	$ 41,035,774	7.00%	$ 2,872,504	$ 43,908,278
Total	**$ 605,277,665**	**22%**	**$ 135,848,581**	**$ 741,126,246**

	Base	**50%**	**80%**
Range Estimate ($000's)	$605,278k	$686,787k	$741,126k

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

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

Houma Navigation Canal Deepening Project 1A 18-Adjacent

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Negligible	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
PS-14	Construction Management			Negligible	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Negligible	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Negligible	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Negligible	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		20%
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1A 18-Adjacent
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$512,947
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$51,295
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$41,036
									$605,278
Risk		$ 10,727	$ 10,127	$ 51,186	$ 17,001	$ 11,217	$ 18,589	$ 17,001	**$135,849**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 10,727	$ 10,127	$ 51,186	$ 17,001	$ 11,217	$ 18,589	$ 17,001	**$135,849**
								Total	**$741,126**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1B 18-Earth**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 116,374,300**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 14,201,300		23.25%	$ 3,301,121	$ 17,502,421
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 102,173,000		32.02%	$ 32,711,969	$ 134,884,969
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 11,637,430		16.15%	$ 1,878,991	$ 13,516,421
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 9,309,944		16.15%	$ 1,503,193	$ 10,813,137
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 116,374,300	30.95%	$ 36,013,090	$ 152,387,390	
Total Planning, Engineering & Design	$ 11,637,430	16.15%	$ 1,878,991	$ 13,516,421	
Total Construction Management	$ 9,309,944	16.15%	$ 1,503,193	$ 10,813,137	
Total	**$ 137,321,674**	**29%**	**$ 39,395,275**	**$ 176,716,949**	

	Base	**50%**	**80%**
Range Estimate ($000's)	$137,322k	$160,959k	$176,717k

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

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

Houma Navigation Canal Deepening Project 1B 18-Earth

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1B 18-Earth
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$14,201
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$102,173
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$11,637
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$9,310
									$137,322
Risk		$ 6,681	$ 2,298	$ 13,050	$ 3,645	$ 2,545	$ 7,319	$ 3,857	**$39,395**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 6,681	$ 2,298	$ 13,050	$ 3,645	$ 2,545	$ 7,319	$ 3,857	**$39,395**
								Total	**$176,717**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1B 18-Earth**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 746,023,940**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations			0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 746,023,940		25.22%	$ 188,176,571	$ 934,200,511
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 74,602,394		9.09%	$ 6,782,312	$ 81,384,706
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 59,681,915		9.09%	$ 5,425,849	$ 65,107,765
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 746,023,940		25.22%	$ 188,176,571	$ 934,200,511
Total Planning, Engineering & Design	$ 74,602,394		9.09%	$ 6,782,312	$ 81,384,706
Total Construction Management	$ 59,681,915		9.09%	$ 5,425,849	$ 65,107,765
Total	**$ 880,308,249**		**23%**	**$ 200,384,733**	**$ 1,080,692,982**

	Base	**50%**	**80%**
Range Estimate ($000's)	$880,308k	$1,000,539k	$1,080,693k

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

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

Houma Navigation Canal Deepening Project 1B 18-Earth

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Negligible	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Marginal	Possible	1
PS-14	Construction Management			Marginal	Possible	1
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Negligible	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Negligible	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Negligible	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Negligible	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Negligible	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks					**Maximum Project Growth**	**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Negligible	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1B 18-Earth
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$746,024
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**1**	**0**	**0**	**0**	**0**	**0**	**0**	$74,602
31 CONSTRUCTION MANAGEMENT	Construction Management	**1**	**0**	**0**	**0**	**0**	**0**	**0**	$59,682
									$880,308
Risk		$ 18,410	$ 14,729	$ 74,444	$ 24,727	$ 16,313	$ 27,035	$ 24,727	**$200,385**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 18,410	$ 14,729	$ 74,444	$ 24,727	$ 16,313	$ 27,035	$ 24,727	**$200,385**
								Total	**$1,080,693**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1C 18-Rock**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 141,456,800**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 14,201,300		23.25%	$ 3,301,121	$ 17,502,421
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 127,255,500		32.02%	$ 40,742,447	$ 167,997,947
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 14,145,680		16.15%	$ 2,283,976	$ 16,429,656
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 11,316,544		16.15%	$ 1,827,181	$ 13,143,725
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 141,456,800	31.14%	$ 44,043,568	$ 185,500,368	
Total Planning, Engineering & Design	$ 14,145,680	16.15%	$ 2,283,976	$ 16,429,656	
Total Construction Management	$ 11,316,544	16.15%	$ 1,827,181	$ 13,143,725	
Total	**$ 166,919,024**	**29%**	**$ 48,154,724**	**$ 215,073,748**	

	Base	**50%**	**80%**
Range Estimate ($000's)	$166,919k	$195,812k	$215,074k

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

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

Houma Navigation Canal Deepening Project 1C 18-Rock

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1C 18-Rock
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$14,201
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$127,256
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$14,146
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$11,317
									$166,919
Risk		$ 8,191	$ 2,793	$ 15,863	$ 4,476	$ 3,093	$ 9,049	$ 4,689	**$48,155**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 8,191	$ 2,793	$ 15,863	$ 4,476	$ 3,093	$ 9,049	$ 4,689	**$48,155**
								Total	**$215,074**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 1C 18-Rock**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 843,880,480**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations			0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 843,880,480		25.22%	$ 212,859,839	$ 1,056,740,319
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	Remaining Construction Items	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	$ 84,388,048		7.00%	$ 5,907,163	$ 90,295,211
14	31 CONSTRUCTION MANAGEMENT	Construction Management	$ 67,510,438		7.00%	$ 4,725,731	$ 72,236,169
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 843,880,480		25.22%	$ 212,859,839	$ 1,056,740,319
Total Planning, Engineering & Design	$ 84,388,048		7.00%	$ 5,907,163	$ 90,295,211
Total Construction Management	$ 67,510,438		7.00%	$ 4,725,731	$ 72,236,169
Total	**$ 995,778,966**		**22%**	**$ 223,492,733**	**$ 1,219,271,699**

	Base	**50%**	**80%**
Range Estimate ($000's)	$995,779k	$1,129,875k	$1,219,272k

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

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

Houma Navigation Canal Deepening Project 1C 18-Rock

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Marginal	Unlikely	0
PS-14	Construction Management			Marginal	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Marginal	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 1C 18-Rock
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$843,880
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$84,388
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$67,510
									$995,779
Risk		$ 17,648	$ 16,661	$ 84,209	$ 27,970	$ 18,453	$ 30,581	$ 27,970	**$223,493**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 17,648	$ 16,661	$ 84,209	$ 27,970	$ 18,453	$ 30,581	$ 27,970	**$223,493**
								Total	**$1,219,272**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2A 20-Adjacent**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 107,948,500**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 16,965,700		23.25%	$ 3,943,711	$ 20,909,411
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 90,982,800		32.02%	$ 29,129,286	$ 120,112,086
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 10,794,850		16.15%	$ 1,742,947	$ 12,537,797
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 8,794		16.15%	$ 1,420	$ 10,214
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 107,948,500	30.64%	$ 33,072,998	$ 141,021,498	
Total Planning, Engineering & Design	$ 10,794,850	16.15%	$ 1,742,947	$ 12,537,797	
Total Construction Management	$ 8,794	16.15%	$ 1,420	$ 10,214	
Total	**$ 118,752,144**	**29%**	**$ 34,817,365**	**$ 153,569,509**	

	Base	**50%**	**80%**
Range Estimate ($000's)	$118,752k	$139,643k	$153,570k

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

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

Houma Navigation Canal Deepening Project 2A 20-Adjacent

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2A 20-Adjacent
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$16,966
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$90,983
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$10,795
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$9
									$118,752
Risk		$ 5,322	$ 2,131	$ 11,502	$ 3,324	$ 2,361	$ 6,600	$ 3,578	**$34,817**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 5,322	$ 2,131	$ 11,502	$ 3,324	$ 2,361	$ 6,600	$ 3,578	**$34,817**
								Total	**$153,570**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2A 20-Adjacent**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 530,504,456**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations			0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 530,504,456		25.22%	$ 133,814,083	$ 664,318,539
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 53,050,446		7.00%	$ 3,713,531	$ 56,763,977
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 8,794		7.00%	$ 616	$ 9,410
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 530,504,456	25.22%	$ 133,814,083	$ 664,318,539	
Total Planning, Engineering & Design	$ 53,050,446	7.00%	$ 3,713,531	$ 56,763,977	
Total Construction Management	$ 8,794	7.00%	$ 616	$ 9,410	
Total	**$ 583,563,696**	**24%**	**$ 137,528,230**	**$ 721,091,926**	
		Base	**50%**	**80%**	
Range Estimate ($000's)		$583,564k	$666,081k	$721,092k	

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

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

Houma Navigation Canal Deepening Project 2A 20-Adjacent

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Marginal	Unlikely	0
PS-14	Construction Management			Marginal	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Marginal	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2A 20-Adjacent
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$530,504
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$53,050
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$9
									$583,564
Risk		$ 11,094	$ 10,474	$ 49,968	$ 17,583	$ 11,601	$ 19,225	$ 17,583	**$137,528**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 11,094	$ 10,474	$ 49,968	$ 17,583	$ 11,601	$ 19,225	$ 17,583	**$137,528**
								Total	**$721,092**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2B 20-Earth**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 129,198,500**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 16,965,700		23.25%	$ 3,943,711	$ 20,909,411
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 112,232,800		32.02%	$ 35,932,741	$ 148,165,541
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 12,919,850		16.15%	$ 2,086,052	$ 15,005,902
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 10,335,880		16.15%	$ 1,668,842	$ 12,004,722
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 129,198,500		30.86%	$ 39,876,452	$ 169,074,952
Total Planning, Engineering & Design	$ 12,919,850		16.15%	$ 2,086,052	$ 15,005,902
Total Construction Management	$ 10,335,880		16.15%	$ 1,668,842	$ 12,004,722
Total	**$ 152,454,230**		**29%**	**$ 43,631,346**	**$ 196,085,576**

	Base	**50%**	**80%**
Range Estimate ($000's)	$152,454k	$178,633k	$196,086k

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

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

Houma Navigation Canal Deepening Project 2B 20-Earth

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2B 20-Earth
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$16,966
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$112,233
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$12,920
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$10,336
									$152,454
Risk		$ 7,390	$ 2,551	$ 14,489	$ 4,029	$ 2,825	$ 8,066	$ 4,282	**$43,631**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 7,390	$ 2,551	$ 14,489	$ 4,029	$ 2,825	$ 8,066	$ 4,282	**$43,631**
								Total	**$196,086**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2B 20-Earth**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 769,046,148**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations			0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 769,046,148		25.22%	$ 193,983,678	$ 963,029,826
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 76,904,615		7.00%	$ 5,383,323	$ 82,287,938
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 61,523,692		7.00%	$ 4,306,658	$ 65,830,350
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -	0.00%	$ -	$ -	
Total Construction Estimate	$ 769,046,148	25.22%	$ 193,983,678	$ 963,029,826	
Total Planning, Engineering & Design	$ 76,904,615	7.00%	$ 5,383,323	$ 82,287,938	
Total Construction Management	$ 61,523,692	7.00%	$ 4,306,658	$ 65,830,350	
Total	**$ 907,474,455**	**22%**	**$ 203,673,659**	**$ 1,111,148,114**	

	Base	**50%**	**80%**
Range Estimate ($000's)	$907,474k	$1,029,678k	$1,111,148k

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

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

Houma Navigation Canal Deepening Project 2B 20-Earth

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Marginal	Unlikely	0
PS-14	Construction Management			Marginal	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Marginal	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2B 20-Earth
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$769,046
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$76,905
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$61,524
									$907,474
Risk		$ 16,083	$ 15,184	$ 76,741	$ 25,490	$ 16,817	$ 27,869	$ 25,490	**$203,674**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 16,083	$ 15,184	$ 76,741	$ 25,490	$ 16,817	$ 27,869	$ 25,490	**$203,674**
								Total	**$1,111,148**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2C 20-Rock**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 156,295,500**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations	$ 16,965,700		23.25%	$ 3,943,711	$ 20,909,411
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 139,329,800		32.02%	$ 44,608,186	$ 183,937,986
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 15,629,550		16.15%	$ 2,523,563	$ 18,153,113
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 12,503,640		16.15%	$ 2,018,850	$ 14,522,490
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 156,295,500		31.06%	$ 48,551,897	$ 204,847,397
Total Planning, Engineering & Design	$ 15,629,550		16.15%	$ 2,523,563	$ 18,153,113
Total Construction Management	$ 12,503,640		16.15%	$ 2,018,850	$ 14,522,490
Total	**$ 184,428,690**		**29%**	**$ 53,094,310**	**$ 237,523,000**

	Base	**50%**	**80%**
Range Estimate ($000's)	$184,429k	$216,285k	$237,523k

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

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

Houma Navigation Canal Deepening Project 2C 20-Rock

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Possible	1
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Moderate	Possible	2
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Moderate	Likely	3
PS-14	Construction Management			Significant	Possible	3
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Possible	1
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Moderate	Possible	2

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Moderate	Possible	2
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Possible	1
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Possible	1
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Possible	1
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Likely	3
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2C 20-Rock
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	$16,966
12 NAVIGATION, PORTS AND HARBORS	Dredging	**2**	**1**	**2**	**2**	**1**	**3**	**2**	$139,330
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$15,630
31 CONSTRUCTION MANAGEMENT	Construction Management	**3**	**0**	**0**	**0**	**0**	**0**	**0**	$12,504
									$184,429
Risk		$ 9,021	$ 3,086	$ 17,527	$ 4,927	$ 3,418	$ 9,935	$ 5,180	**$53,094**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 9,021	$ 3,086	$ 17,527	$ 4,927	$ 3,418	$ 9,935	$ 5,180	**$53,094**
								Total	**$237,523**

Abbreviated Risk Analysis

Project (less than $40M): **Houma Navigation Canal Deepening Project** **Alternative: 2C 20-Rock**

Project Development Stage/Alternative: **Feasibility (Alternatives)**

Risk Category: **Low Risk: Typical Construction, Simple** **Meeting Date: 11/2/2015**

Total Estimated Construction Contract Cost = **$ 881,596,248**

	CWWBS	Feature of Work	Contract Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0.00%	$ -	$ -
1	02 RELOCATIONS	Relocations			0.00%	$ -	$ -
2	12 NAVIGATION, PORTS AND HARBORS	Dredging	$ 881,596,248		25.22%	$ 222,373,238	$ 1,103,969,486
3			$ -		0.00%	$ -	$ -
4			$ -		0.00%	$ -	$ -
5			$ -		0.00%	$ -	$ -
6			$ -		0.00%	$ -	$ -
7					0.00%	$ -	$ -
8			$ -		0.00%	$ -	$ -
9			$ -		0.00%	$ -	$ -
10			$ -		0.00%	$ -	$ -
11			$ -		0.00%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ -	*0.0%*	0.00%	$ -	$ -
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 88,159,625		7.00%	$ 6,171,174	$ 94,330,799
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 70,527,700		7.00%	$ 4,936,939	$ 75,464,639
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

Totals					
Real Estate	$ -		0.00%	$ -	$ -
Total Construction Estimate	$ 881,596,248		25.22%	$ 222,373,238	$ 1,103,969,486
Total Planning, Engineering & Design	$ 88,159,625		7.00%	$ 6,171,174	$ 94,330,799
Total Construction Management	$ 70,527,700		7.00%	$ 4,936,939	$ 75,464,639
Total	**$ 1,040,283,573**		**22%**	**$ 233,481,351**	**$ 1,273,764,924**

	Base	**50%**	**80%**
Range Estimate ($000's)	$1,040,284k	$1,180,373k	$1,273,765k

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

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

Houma Navigation Canal Deepening Project 2C 20-Rock

Feasibility (Alternatives)

Abbreviated Risk Analysis

Meeting Date: 2-Nov-15

Risk Level

	Negligible	Marginal	Moderate	Significant	Critical
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 Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Scope Growth				**Maximum Project Growth**		**40%**
PS-1	Relocations	Some utility elevations could not be determined. Relocation costs are 6 years old. Unidentified utilities or oil/gas infrastructure could be located during construction.	The need for additional relocations are a possability, which would increase the scope of the project and mpact cost/schedule.	Marginal	Unlikely	0
PS-2	Dredging	A full Dredged Material Disposal Plan has not been developed. Some depths and elevations for proposed disposal areas were assumed, without survey data. Disposal quantities could also be increased based on low maintenance activities and old survey information. It could be determined that foreshore protection and rock retention could be required in additional areas other than those recommended. This could lead to the need for additional rock retention, foreshore protection, and floatation channel dredging.	The proposed disposal locations will be revisted during the design phase, but some changes to the costs associated with the current plan is likely. Additional quantites could require changes to the proposed disposal areas and lead to increases in scope. Any changes to the rock requirements could increase the project scope, but it would have a minimal impact on overall costs.	Marginal	Possible	1
PS-3	0			Moderate	Possible	N/A
PS-4	0			Negligible	Unlikely	N/A
PS-5	0			Negligible	Unlikely	N/A
PS-6	0			Negligible	Unlikely	N/A
PS-7	0			Negligible	Unlikely	N/A
PS-8	0			Negligible	Unlikely	N/A
PS-9	0			Negligible	Unlikely	N/A
PS-10	0			Negligible	Unlikely	N/A
PS-11	0			Negligible	Unlikely	N/A
PS-12				Marginal	Possible	N/A

PS-13	Planning, Engineering, & Design			Marginal	Unlikely	0
PS-14	Construction Management			Marginal	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Relocations	Contract could require specialized work associated with environmental impacts of pipeline relocation and proper containment of material. The offshore nature of the work could limit the number of bids received to larger contracting companies.	A specialized pipeline relocation contractor could require a higher unit cost with a less competative bid. The overall cost ramifications of this would be minimal when compared to overall project costs.	Marginal	Unlikely	0
AS-2	Dredging	Dredging methodology for channel deepening would be widely available within south Louisiana, but offshore nature of the work could limit the number of bids.	A reduced number of bids could result in higher unit costs. However, based on the amount of ongoing dredging work within the channel over the past 20 years, it is believed the likihood of this occuring is minimal.	Marginal	Possible	1
AS-3	0			Moderate	Likely	N/A
AS-4	0			Negligible	Unlikely	N/A
AS-5	0			Negligible	Unlikely	N/A
AS-6	0			Negligible	Unlikely	N/A
AS-7	0			Negligible	Unlikely	N/A
AS-8	0			Negligible	Unlikely	N/A
AS-9	0			Negligible	Unlikely	N/A
AS-10	0			Negligible	Unlikely	N/A
AS-11	0			Negligible	Unlikely	N/A
AS-12				Negligible	Unlikely	N/A
AS-13	Planning, Engineering, & Design			Negligible	Unlikely	0
AS-14	Construction Management			Negligible	Unlikely	0
Construction Elements				**Maximum Project Growth**		**15%**
CE-1	Relocations	Boat access would be required for relocations. Mobilization/Demobilization could take longer than anticipated. The potential exists for low-frequency weather events to delay work. Marine work could result in lower than anticipated productivity.	Impacts due to extended weather delays would be the most significant impact to cost and schedule, but the likelihood is low. With the amount of oil infrastructure existing in south Louisana, it is assumed a contractor familiar with the challenges of offshore pipeline relocation would be chosen. Therefore productivity issues would be minimal.	Marginal	Unlikely	0

CE-2	Dredging	Boat access would be required for survey crews and dredging equipment/crews. The potential exists for low-frequency weather events to delay work. Remote location of project could impact schedule if repairs are necessary to dredging equipment. Dredging methods would be fairly straight forward.	Dredging work is commonplace within the channel, so the risk of schedule delays or reduced productivity would center around the remote location or extreme weather events, not the dredging methods. The impact of a significant storm could be significant but liklihood is small.	Marginal	Possible	1
CE-3	0			Marginal	Possible	N/A
CE-4	0			Negligible	Unlikely	N/A
CE-5	0			Negligible	Unlikely	N/A
CE-6	0			Negligible	Unlikely	N/A
CE-7	0			Negligible	Unlikely	N/A
CE-8	0			Negligible	Unlikely	N/A
CE-9	0			Negligible	Unlikely	N/A
CE-10	0			Negligible	Unlikely	N/A
CE-11	0			Negligible	Unlikely	N/A
CE-12				Negligible	Unlikely	N/A
CE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
CE-14	Construction Management			Negligible	Unlikely	0
Quantities for Current Scope				**Maximum Project Growth**		**20%**
Q-1	Relocations	The elevations of some pipelines are assumed or unkown. The potential exists for some unknown oil/gas infrastructure to be present. Shoaling rates utilized are based on past data, but the infrequency of maintenance dredging could result in pipelines found to be deeper than anticipated.	The potential exists for increased quantity requirements during the relocation phase of the project, but the cost impact would be small when compaed to the overall cost of the project.	Marginal	Unlikely	0
Q-2	Dredging	Disposal quantities could be underestimated based on the infrequent nature of maintenance dredging over the past 20 years. Pipeline distances may change is disposal areas are changed. Disposal area capacities are based on assumed depths without data from surveys.	Additional costs could be significant if additional dredging is required to achieve target depth. Dredging quantites required are based on dated survey information and assumed shoaling rates. Changes to the disposal plan during the design phase could increase costs.	Moderate	Possible	2
Q-3	0			Negligible	Likely	N/A
Q-4	0			Negligible	Unlikely	N/A

Q-5	0			Negligible	Unlikely	N/A
Q-6	0			Negligible	Unlikely	N/A
Q-7	0			Negligible	Unlikely	N/A
Q-8	0			Negligible	Unlikely	N/A
Q-9	0			Negligible	Unlikely	N/A
Q-10	0			Negligible	Unlikely	N/A
Q-11	0			Negligible	Unlikely	N/A
Q-12				Negligible	Unlikely	N/A
Q-13	Planning, Engineering, & Design			Negligible	Unlikely	0
Q-14	Construction Management			Negligible	Unlikely	0
Specialty Fabrication or Equipment				**Maximum Project Growth**		**50%**
FE-1	Relocations	Transportation of pipe and other relocation materials/equipment could take longer than anticipated due to remote location of work. Equipment repairs could take longer as well. An increased lilihood of equipment failure could exist from working in a marine environment.	Equipment transport of failure would likely be more expensive, resulting in increased unit costs and schedule delays during construction. However, these costs would represent a small portion of the overall project cost.	Marginal	Unlikely	0
FE-2	Dredging	Remote location of project could impact cost and schedule if repairs are necessary to dredging equipment. The transport of crews and equipment could take longer than anticipated, resulting in reduced productivity.	The decreased productivity resulting from longer than anticipated maintenance and equipment/part delivery could increase both costs and the schedule. However, it is believed that the impacts due to these issues would be minimal when compared to the overall cost of the project.	Marginal	Possible	1
FE-3	0			Negligible	Unlikely	N/A
FE-4	0			Negligible	Unlikely	N/A
FE-5	0			Negligible	Unlikely	N/A
FE-6	0			Negligible	Unlikely	N/A
FE-7	0			Negligible	Unlikely	N/A
FE-8	0			Negligible	Unlikely	N/A
FE-9	0			Negligible	Unlikely	N/A

FE-10	0			Negligible	Unlikely	N/A
FE-11	0			Negligible	Unlikely	N/A
FE-12				Negligible	Unlikely	N/A
FE-13	Planning, Engineering, & Design			Negligible	Unlikely	0
FE-14	Construction Management			Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**25%**
CT-1	Relocations	The unit prices for pipeline relocations are based on the 2009 estimate conducted by the Corps. Cost will be escilated to 2015 levels based on the Corps escalation indices. The elevation of some pipelines are unkown and need to be assumed for this phase of the project.	The potential exists for the unit costs of relaocations to be increased subsequent to the plannig phase of the project. This would result in marginally increased cost for the overall project.	Marginal	Unlikely	0
CT-2	Dredging	Shoaling rates are based on past data and the disposal plan used for development of dredging unit costs is based on assumptions associated with the existing disposal areas. Dredging quantities are also based on an assumed starting depth of the channel and could could be increased once a survey is conducted. Productivity rates were developed via CEDEP which is based on disposal plan assumptions as well.	It is possible that dredging quantities would increase during the design phase of the project, once more information in know about the existing depths of the channel. This would result in moderate increases to the project costs. It is also possible that the dredged material disposal plan would be modified based on new data, potentially increasing costs.	Moderate	Possible	2
CT-3	0			Moderate	Possible	N/A
CT-4	0			Negligible	Unlikely	N/A
CT-5	0			Negligible	Unlikely	N/A
CT-6	0			Negligible	Unlikely	N/A
CT-7	0			Negligible	Unlikely	N/A
CT-8	0			Negligible	Unlikely	N/A
CT-9	0			Negligible	Unlikely	N/A
CT-10	0			Negligible	Unlikely	N/A
CT-11	0			Negligible	Unlikely	N/A
CT-12				Negligible	Unlikely	N/A
CT-13	Planning, Engineering, & Design			Negligible	Unlikely	0

CT-14	Construction Management			Negligible	Unlikely	0
External Project Risks				**Maximum Project Growth**		**20%**
EX-1	Relocations	Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits. This would increase the cost of equipment operation and material/crew transport.	Increases in fuel prices are likely to impact costs. These impacts would be moderate due to the heavy reliance on fuel to operate equipment and transport material. Overall the impacts to cost would be moderate.	Marginal	Unlikely	0
EX-2	Dredging	Extreme weather events are a possibility in Coastal Louisiana, with the potential to delay the project significantly or damage construction equipment. Shoaling rates would also increase during such an event, potentially impacting dredging quantities. Fuel prices used for the estimate are near a two-year low, so the potential for increased fuel costs exiits.	Increases in fuel prices are likely and the cost impact would be moderate. Storm impacts could be significant, but the liklihood is small. The cost and schedule impacts would be marginal. Overall the impacts to cost would be moderate.	Moderate	Possible	2
EX-3	0			Marginal	Possible	N/A
EX-4	0			Negligible	Unlikely	N/A
EX-5	0			Negligible	Unlikely	N/A
EX-6	0			Negligible	Unlikely	N/A
EX-7	0			Negligible	Unlikely	N/A
EX-8	0			Negligible	Unlikely	N/A
EX-9	0			Negligible	Unlikely	N/A
EX-10	0			Negligible	Unlikely	N/A
EX-11	0			Negligible	Unlikely	N/A
EX-12				Negligible	Unlikely	N/A
EX-13	Planning, Engineering, & Design			Negligible	Unlikely	0
EX-14	Construction Management			Negligible	Unlikely	0

Houma Navigation Canal Deepening Project 2C 20-Rock
Feasibility (Alternatives)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Scope Growth	Acquisition Strategy	Construction Elements	Quantities for Current Scope	Specialty Fabrication or Equipment	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
02 RELOCATIONS	**Relocations**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0
12 NAVIGATION, PORTS AND HARBORS	Dredging	**1**	**1**	**1**	**2**	**1**	**2**	**2**	$881,596
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$88,160
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$70,528
									$1,040,284
Risk		$ 18,437	$ 17,406	$ 87,972	$ 29,220	$ 19,278	$ 31,948	$ 29,220	**$233,481**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 18,437	$ 17,406	$ 87,972	$ 29,220	$ 19,278	$ 31,948	$ 29,220	**$233,481**
								Total	**$1,273,765**