

**APPENDIX B
COST ENGINEERING AND RISK ANALYSIS**

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B. COST ESTIMATES

B.1 GENERAL INFORMATION

Corps of Engineers cost estimates for planning purposes are prepared in accordance with the following guidance:

- Engineer Regulation (ER) 1110-1-1300, Cost Engineering Policy and General Requirements, 26 March 1993
- ER 1110-2-1302, Civil Works Cost Engineering, 30 June 2016
- ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999
- ER 1105-2-100, Planning Guidance Notebook, 22 April 2000, as amended
- Engineer Manual (EM) 1110-2-1304 (Tables Revised 30 September 2018), Civil Works Construction Cost Index System, 30 September 2018
- CECW-CP Memorandum for Distribution, Subject: Initiatives to Improve the Accuracy of Total Project Costs in Civil Works Feasibility Studies Requiring Congressional Authorization, 19 September 2007
- CECW-CE Memorandum for Distribution, Subject: Application of Cost Risk Analysis Methods to Develop Contingencies for Civil Works Total Project Costs, 3 July 2007
- Cost and Schedule Risk Analysis Process, March 2008

The goal of the Planning Level cost estimate for the Lake Okeechobee Watershed Restoration Project (LOWRP) study is to present a Total Project Cost (Construction and Non-construction cost) for the selected plan, in today's dollars, for project justification/authorization. Additionally, the total project cost summary sheet calculates a fully funded estimate (escalated for inflation through project completion) for budgeting purposes. The intent of these costing efforts is to produce a final product (cost estimate) that is reliable and accurate and that supports the definition of the Government's and the non-Federal sponsor's obligations. This estimate was prepared with the project at the primary level and the Civil Works Breakdown Structure (CWBS) features code at the secondary Level and is supported by labor, equipment, and materials for the majority of the cost items, however a few cost items are priced based on parametric tools with Historical data. A risk analysis was prepared that addresses uncertainties in the project and sets contingencies for selected plan cost items. A discussion of the risk analysis is included at the end of this appendix.

B.1.2 PLAN FORMULATION COST ESTIMATES

The plan formulation is described in the Main Report. The final alternatives considered for the reservoirs are:

- Alternative 1Bshlw: This alternative includes K-05 combined with the 80 ASR Wells.
- Alternative 1B WAF: This alternative includes K-05 wetland attenuation feature with the 80 ASR Wells.
- Alternative 2CR: This alternative includes K-42 Revised with the 65 ASR Wells.

The Wetland Restoration plan formulation includes:

- Alternative 1: Kissimmee River North
- Alternative 2.1: Kissimmee River Center SOW #1
- Alternative 2.2: Kissimmee River Center SOW #2
- Alternative 3.1: Kissimmee River South SOW #1
- Alternative 3.2: Kissimmee River South SOW #2
- Alternative 4: Paradise Run
- Alternative 5: IP-10
- Alternative 6: LO-W

B.1.2.1 Reservoir Project Description

- **Alternative 1Bshlw:** This alternative includes shallow storage feature on K-05. The major features include 25.22 miles of a 16.50 feet high perimeter embankment with a perimeter canal, cutoff wall, and a perimeter toe road. There are 5.6 miles of internal embankment, two double culverts with gates, two emergency spillways, two seepage pump systems, and one inflow pump station. In addition, this alternative will include the 80 ASR Wells.
- **Alternative 1BW:** This alternative includes a wetland attenuation feature on K-05. The major features include 26.24 miles of a 15.50 feet high perimeter embankment with a perimeter canal, and a perimeter toe road. There are 3.10 miles of internal embankment, two double culverts with gates, two emergency spillways, two seepage pump systems, and one inflow pump station. In addition, this alternative will include the 80 ASR Wells. The Wetland Restoration was evaluated independent from the reservoir.
- **Alternative 2Cr:** This alternative includes a Reservoir on K-42. The major features include 21.16 miles of a 27.5 feet high perimeter embankment with perimeter canal, cutoff wall, and perimeter toe road. There are 5 miles of internal embankment, two double culverts with gates, two emergency spillways, two seepage pump systems, and two inflow pump stations. In addition, this alternative includes the 65 ASR Wells.

B.1.2.2 Wetland Restoration Descriptions

- **Alternative 2.2 – Kissimmee River Center SOW #2:** The scope of work for this alternative includes: The creation of a new river to imitate historical water flow and to divert water into the new river from C-38 with a submerged weir. The length was initially assumed to be 16,939 LF but was later changed to 21,500 LF.
- **Alternative 4 – Paradise Run:** The scope of work for this alternative includes: an initial assumption of the construction of a new Pump Station (150 CFS), the creation of a new channel (73,500 LF), the construction of an overflow/step weir, and the construction of a new culvert through Herbert Hoover Dike to connect the new channel to C-38.

B.1.3 Project Scope for Recommended Plan

The Recommended Plan consists of four major features: WAF, ASR wells (55 watershed ASR wells, 25 wetland attenuation ASR wells), and Kissimmee River-Center Wetland, and the Paradise Run Wetland restoration sites. The project will improve the quantity, timing and distribution of water entering Lake Okeechobee, provide for better management of lake water levels, reduce flows to the Caloosahatchee and St. Lucie estuaries (collectively referred to as the Northern Estuaries), improve system-wide operational flexibility, and will restore portions of the historic Kissimmee River channel and floodplain.

The WAF is located within the Indian Prairie sub-watershed west of the C-38 canal, north of SR 78, east of the Seminole Tribe of Florida Brighton Reservation, and south of the C-41A canal. The flow-through WAF is primarily used for surface water storage to attenuate peak flows into Lake Okeechobee from the Kissimmee River Basin. The secondary purpose is to provide for emergent wetland habitat. Wetland attenuation ASR wells will rehydrate habitat during dry times to ensure that wetland conditions are maintained within the WAF footprint. The WAF footprint, including the embankments, seepage canal, and other perimeter features, is approximately 13,600 acres with a storage capacity of approximately 46,000 ac-ft. The WAF includes a pump station located downstream of the existing S-84 structure on the C-41A canal serves as the water source for the proposed WAF. The pump draws water from the downstream area that is part of Lake Okeechobee

Eighty 5-MGD ASR wells are proposed in clusters in various locations throughout the watershed and co-located with the WAF. The wells clusters will include a combination of ASR wells that will utilize either the UFA or the APPZ for storage and recovery.

The Kissimmee River–Center site is approximately 1,200 acres and is located on the west bank of the C-38 canal about halfway between S-65D and S-65E. A submerged weir will be placed in the C-38 canal at the north end of the site to divert water to the west into a created river channel mimicking the historic Kissimmee River. About 21,500 feet of channel excavation will be performed to create riverine habitat and new floodplain wetlands. The S-735 Pump Station serves as the intake pump for the Kissimmee River – Center Wetland. S-734 is located at the northern end of the wetland on the C-38 Canal downstream of the S-65D Spillway. Two electric 50 cfs pumps draw water from C-38 Canal to maintain a surface elevation of approximately 25.0 feet (NAVD88) within the wetland. Pump intakes are enclosed in reinforced concrete bays with a wall between the intakes. A trash rack in each bay prevents debris from blocking the intake pumps. A concrete superstructure houses the pumps above the intake bays with separate rooms for electrical equipment and backup generator. A service bridge above the intake bays allows for vehicle access across the pump station and access to the trash racks.

The Paradise Run site is approximately 3,600 acres containing historic Kissimmee River channel and floodplain. The site is located downstream of S-65E on the west bank of the C-38 canal, between the C-41A canal and the Buckhead Ridge community. The major features include a pump station on the C-41A canal downstream of S-84 serves as the water source to restore natural flow to the river and hydroperiod to the floodplain wetlands. The pump station will draw water into the historic Kissimmee River channel running through the Paradise Run site. About 24,500 linear feet of channel excavation will be performed

as opposed to the initial assumption of 73,500 linear feet. An overflow weir will be placed between the north and south sections of Paradise Run to control the flow and to connect both sides through the L-59 berms. The flow will **release** back into the C-38 canal by way of a culvert through the HDD on the southeast corner of the site. Additionally, the pump station size assumption has been changed from 150 cfs to 200 cfs. The S-721 Pump Station is the intake pump station for the Paradise Run Wetland feature and is located near the S-720 Pump Station on the northern limits of the Paradise Run Wetlands. Water is drawn from the C-41A Canal downstream of the S-84 spillway. The pump station has two electric 100 cfs pumps housed in a reinforced concrete building with a backup generator. Pump intakes are enclosed in reinforced concrete bays with a wall between the intakes. Trash rakes mounted in the intake bays keep debris away from the pump intakes. A 16 foot wide service bridge spans the intake bays to allow vehicle traffic across the pump station.

B.1.4 Estimating Methodology

The MCACES/MII cost estimate for the Selected Plan is based on the pre-final Engineering Appendix and Annex C-1 (Plans) provided. The estimate is formatted in the CWWBS.

The estimate include both construction and non-construction costs. The construction costs fall under the following feature codes:

- 02 Relocations
- 03 Reservoirs
- 09 Channel and Canals
- 11 Levees and Floodwalls
- 13 Pumping Plant
- 14 Recreation Facilities
- 15 Flood Control and Diversion Structures
- 19 Building, Grounds & Utilities

The non-construction costs fall under the following feature codes:

- 01 Lands and Damages
- 30 Planning, Engineering, and Design
- 31 Construction Management

Direct Cost. The direct cost for project elements identified in the plans and Scope of Work were developed in the MCACES/MII estimate using labor, equipment, and materials for the majority of the cost items. However, some cost items are priced using parametric tools based on Historical data. The database line item productivities have been used where possible with productivity adjustments made as necessary. Where required, new crews have been created using the appropriate number of equipment, size of equipment, and labor trades to fit the work activity.

The estimate assumes the prime contractor shall be a heavy civil contractor and will self-perform embankment placement, excavation, foundation drain installation for embankment and canal work. Dewatering and seeding & Sodding and general construction work will be subcontracted.

The estimates assumes the prime contractor shall be a general contractor and will self-perform structural concrete and site preparation. The mechanical and electrical work will be subcontracted.

Crew productivity were adjusted as necessary for efficiency factor / weather delays. In addition, a 7% material sales tax and a 25% overtime markups have been included in the estimate.

The following prime contractor's markups were applied to the direct and sub-contractor's costs:

- Job Office Overhead - 15.0% Prime contractor; 8.0% Sub-contractor
- Home Office Overhead - 10.0% Prime contractor, 15.0% Sub-contractor
- Profit - 9.37% Prime contractor & Sub-contractor
- Performance Bond: 1.59% Table B

The risk analysis performed resulted in a 28% schedule contingency and 31% cost contingency. Additional information follows on the risk analysis. Major risk factors are shown in the sensitivity analyses. A Cost and Schedule Risk Analysis was conducted according to the procedures outlined in the following documents and sources:

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

Operations and Maintenance (O&M) cost for each of the project's features were considered for the Economic Analysis; O&M costs were omitted from the cost estimates but included in the Economic Analysis. Refer to the Main Report for additional details.

Non-construction costs include Real Estate, Planning, Engineering and Design (PED), and Construction Management (Supervision and Administration, S&A). All real estate costs were provided by Real Estate Division. The cost include relocation assistance, land acquisition, and administrative cost.

Planning, Engineering and Design cost were calculated based upon a percentage of 15.7%.

Construction Management cost were calculated based upon a percentage of 10.0%

B.1.5 Project Schedule

The project schedule was prepared by the Engineering Division in collaboration with Project Management. The construction duration and sequence were established based on Historical Data. The construction schedule will be changed as the design of the project proceeds into plans and specifications phase. Once the contract is award, the contractor will provide a construction schedule that may be different from this draft schedule based on Historical data. The project schedule is provided below.

B.1.6 Total Project Cost Summary

The Total Project Cost Summary (TPCS) includes escalation through project completion. The MCACES/MII estimate is priced in today's dollars and does not contain escalation to midpoint of construction since this is incorporated in the TPCS.

The cost estimate for the Selected Plan is prepared with an identified price level date. Inflation factors are used to adjust the pricing to the project schedule. This estimate is known as the Fully Funded Cost Estimate of Total Project Cost Summary. It includes all Federal and non-Federal cost: Lands, Easements, Rights of Way and Relocations; construction features; Preconstruction Engineering and Design; Construction Management; Contingency; and Inflation.

B.2 SCHEDULE DEVELOPMENT

The project schedule include the construction and non-construction activities. The construction duration for the nine contracts was developed using historical data and duration extracted from the MCACES/MII estimate. The contracts sequence was developed by analyzing the project features, benefits, and possible funding stream.

ID	Task Name	Duration	Start	Finish	1st Quarter		3rd Quarter													
					Oct	Jun	Feb	Oct	Jun	Feb	Oct	Jun	Feb	Oct	Jun	Feb	Oct	Jun	Feb	Oct
35	Tree Island	44 mons	Sun 10/2/39	Wed 5/13/43																
42	[09] Channels and Canals	96 mons	Tue 10/23/35	Thu 9/10/43																
43	[09A] Channels and Canals, Perimeter Canal	96 mons	Tue 10/23/35	Thu 9/10/43																
48	[09B] Channels and Canals, Intake Canal	9 mons	Wed 4/15/37	Sat 1/9/38																
53	[09F] Channels and Canals (Outlet Canal Built with Levees)	24 mons	Sat 4/10/38	Thu 3/29/40																
60	[13A] Pumping Station, S-720 of 1,600 cfs; S725 of 100 cfs; S-733 of 100 cfs	36 mons	Tue 9/16/42	Wed 8/30/45																
61	[14] Recreation	12 mons	Sat 3/4/45	Mon 2/26/46																
62	[15A] Flood Control and Diversion Structures, Spillways (S-724, S-724W, S-727, S727W, S-737, S-737W, S-728, and S-728W)	59 mons	Sun 4/20/36	Fri 2/22/41																
63	S-724 Cell Spillway	24 mons	Wed 9/17/36	Mon 9/6/38																
71	S-724W Auxiliary Spillway	6 mons	Wed 4/15/37	Sun 10/11/37																
76	S-727 Cell Spillway	24 mons	Mon 3/16/37	Sat 3/5/39																
84	S-727W Auxiliary Spillway	6 mons	Sat 9/12/37	Wed 3/10/38																
89	S-737 Cell Spillway	24 mons	Sun 3/6/39	Fri 2/22/41																
97	S-737W Auxiliary Spillway	6 mons	Fri 9/2/39	Tue 2/28/40																
102	S-728 Outlet Spillway	30 mons	Sun 4/20/36	Wed 10/6/38																
110	S-728W Auxiliary Spillway	6 mons	Wed 4/15/37	Sun 10/11/37																

Project: LOWP Program Schedule Date: Tue 4/30/19	Task		External Tasks		Manual Task		Finish-only	
	Split		External Milestone		Duration-only		Deadline	
	Milestone		Inactive Task		Manual Summary Rollup		Progress	
	Summary		Inactive Milestone		Manual Summary			
	Project Summary		Inactive Summary		Start-only			

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ID	Task Name	Duration	Start	Finish	1st Quar	3rd Quar	1st C						
					Oct	Jun	Feb	Oct	Jun	Feb	Oct	Jun	Feb
164	[03] Embankment	12 mons	Fri 3/3/28	Sun 2/25/29									
172	[09] Channels and Canals	24 mons	Fri 3/3/28	Wed 2/20/30									
176	[11] L-59 Levee Plug	24 mons	Fri 3/3/28	Wed 2/20/30									
181	[13A] Pumping Plant, S-721 Pump Station 200 cfs	24 mons	Wed 8/30/28	Mon 8/19/30									
182	[14] Recreation	3 mons	Sat 8/14/32	Thu 11/11/32									
183	[15A] Flood Control and Diversion Structures, S-731 WAF Outlet Spillway	24 mons	Sat 3/3/29	Thu 2/20/31									
192	[15B] Flood Control and Diversion Structures, S-729, S-730 and S-732 Culvert Structures	36 mons	Thu 8/30/29	Fri 8/13/32									
193	S-729 Riser Culvert Structure	20 mons	Thu 8/30/29	Mon 4/21/31									
200	S-730 Gated Culvert Structure	27 mons	Sat 4/27/30	Wed 7/14/32									
207	S-732 Riser Culvert Structure	20 mons	Mon 12/23/30	Fri 8/13/32									

The Gantt chart displays the project schedule with tasks represented by horizontal bars. Dependencies are shown with arrows. The chart includes tasks such as [03] Embankment, [09] Channels and Canals, [11] L-59 Levee Plug, [13A] Pumping Plant, S-721 Pump Station 200 cfs, [14] Recreation, [15A] Flood Control and Diversion Structures, S-731 WAF Outlet Spillway, [15B] Flood Control and Diversion Structures, S-729, S-730 and S-732 Culvert Structures, S-729 Riser Culvert Structure, S-730 Gated Culvert Structure, and S-732 Riser Culvert Structure. The chart shows the start and end dates for each task and their dependencies.

Project: LOWP Program Schedule Date: Tue 4/30/19	Task		External Tasks		Manual Task		Finish-only	
	Split		External Milestone		Duration-only		Deadline	
	Milestone		Inactive Task		Manual Summary Rollup		Progress	
	Summary		Inactive Milestone		Manual Summary			
	Project Summary		Inactive Summary		Start-only			

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B.3 RISK AND UNCERTAINTY ANALYSIS

B.3.1 Risk Analysis Methods

The risk analysis process for this study followed the USACE Headquarters requirements as well as the guidance provided by the Cost Engineering Directory of Expertise for Civil Works (Cost Engineering DX). The risk analysis process reflected within this report uses probabilistic cost and schedule risk analysis methods within the framework of the Oracle Crystal Ball software application. First, members of the PDT met to identify risk items, in both the construction cost estimate and the construction schedule. Then, the Risk Register was completed. After that, the Risk Model was customized using commercially available 'Crystal Ball' software. The most likely 'high,' and 'low' values were assigned to estimate items using the software's 'Assumption' function and the triangular distribution. 'Forecasts' were then defined and the model was run.

After the model was run the results were extracted from the sensitivity chart, the forecast chart and the percentiles table for major items. The percentiles were then used to determine the contingency at the 80% confidence level. The appropriate contingency was then applied to the MCACES/MII estimate for the Selected Plan, producing the 'After Risk Analysis' cost estimate contained herein. Upon completion of this estimate the Total Project Cost Summary was prepared.

B.3.2 Risk Analysis Results

Results of the risk analysis are shown below. First, the risk register is presented, then results are given for the construction costs and the schedule. For each major item studied, the results include a sensitivity chart, a percentile table including the most likely cost and contingencies. Finally, a table is shown providing contingencies.

B.3.2.1 Risk Register

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)
Organizational and Project Management Risks (PM)									
PM1	PED Labor Availability	The project requires a significant design team and any delays end up compounding the work with design and re-design efforts on other phases/projects which could result in design delay.	Jacksonville has adequate manpower to handle this project. This PED starts after the current list of projects will be completed. No impact expected. Unplanned work could pull PED labor away. Solutions include sharing work with other districts and A/Es.	Unlikely	Negligible	Low	Possible	Marginal	Low
PM2	Vertical Chain Approval and Review	Future milestone decisions must be presented through either the Executive Leadership Board, RMC, DSOG and/or HQ depending on the scope and cost of the proposed revision.	This reviews and approvals will be required. Based on the long term schedule these shorter delays will not have an impact on the project schedule. Project schedule description in Risk ES6.	Very Likely	Negligible	Low	Very Likely	Negligible	Low
PM3	Current Feasibility Study Funding	Finalizing project deliverables may be constrained due to insufficient funding requests, potentially impacting completion of the feasibility report.	Non-issue. Adequate funding in place.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
PM4	Project Execution	There is the potential SAJ could have multiple large projects concurrently in construction, resulting in potential schedule delays due to the districts inability to execute several hundred million in work yearly.	There is potential for design impact. If necessary, there will be time for AE product review. Any challenges to the data collection and reports would delay the PED design. Yearly funding discussion in Risk PM5.	Unlikely	Negligible	Low	Possible	Marginal	Low
PM5	Sponsor Funding	What is likelihood of sponsor funding issues?	Sponsor is State funded. Similar to Risk EX5. Cost share for this project is 50/50. More likely USACE would experience funding issues than the sponsor.	Possible	Marginal	Low	Possible	Marginal	Low
PM6	Federal Funding	What is likelihood of Federal funding issues?	Federal funding could result in schedule risk - not certain if all of funding will be received at one time. Congressional budget uncertainty and lateness could result in several 6 month funding delays over the length of this project. No O&M funding is considered for this project. No cost impacts are anticipated. If there is a schedule delay this will be modeled in the Cost from Schedule. If the project is delayed one or more years then escalation will be applied appropriately to cover this increase.	Very Likely	Negligible	Low	Very Likely	Marginal	Medium

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (\$)	Impact (\$)	Risk Level (\$)
Contract Acquisition Risks (CA)									
CA1	Bid Protest	Protests on contracts of this magnitude are always a possibility.	Typical protest here in SAJ could result in a 6 month delay. Typical to get a protest or two every year, with ~100 actions this is <2% probability.	Unlikely	Negligible	Low	Possible	Marginal	Low
CA2	Extended Duration	If the project duration must be extended for various reasons	There is already a large float in the schedule and any additional time added to the schedule would only impact the schedule via escalation.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
CA3	Contract Acquisition Strategy	Design bid build, assume several contracts	The current strategy is design, bid, build and is represented in the baseline cost estimate. Unlikely to do design-build. Small business for 15% of project is likely.	Very Likely	Marginal	Medium	Unlikely	Negligible	Low
CA4	Market Conditions and Bidding Climate	Good pool of construction contractors	No impact expected. Large enough project that will attract many qualified contractors.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
CA5	8(a) and Small Business	The size of and complexity of the relocations contractors lends them to Small Business contracts.	See Risk CA3. SBA small business in estimate already, no additional impact anticipated.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
CA6	Multiple Contracts	Additional contract(s) could lead to additional mob/demob costs.	In the estimate, mob/demob already captured for each feature. There is a possible cost impact for the WAF due to additional contracts divisions.	Likely	Marginal	Medium	Unlikely	Negligible	Low
General Technical Risks (TR)									
TR1	Limited Geotechnical Data for Levees	Side slopes, levee configuration design considerations can differ depending on the local geotechnical data	<p>Borrow sites all within 1.5 mile radius. Material is coming from excavated canals and the balance is coming from borrow sites. The filter and bentonite wall is imported material and accounted for already.</p> <p>80% assumed suitable for reuse, 3M cy of borrow.</p> <p>Could also be a hard layer in excavating the canal, but not likely, that would impact production rates and haul lengths.</p> <p>Possible credit for embankment for value engineering for wave run-up, could change the height of the levee.</p>	Possible	Moderate	Medium	Possible	Negligible	Low
TR2	Limited Geotechnical Data for Foundations	Foundation configuration design considerations can differ depending on the local geotechnical data	<p>Estimate already includes this risk. Levee lengths were not deducted for these features.</p> <p>May need to preload the location of structures to prevent settling.</p>	Likely	Marginal	Medium	Unlikely	Negligible	Low
TR3	Soil HTRW	Contaminated soil	<p>Phase I and field investigation completed. Assumption Phase II is not needed. Going to landfill for disposal site- highly contaminated material capability would need to go to Sawyer Landfill- an additional 25 miles of trucking plus disposal costs. Need a contingency plan how this will be handled if contaminated material is found during exploration or construction. Assume 1% contaminated ~2.5k cy @ \$150/cy = \$375k risk which is negligible. Potential cattle-dipping (arsenic used to remove parasites on cows) in unlined pits on site. Copper put in soil in tomato fields would also require remediation between Paradise Run and WAF.</p>	Unlikely	Negligible	Low	Unlikely	Negligible	Low

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)
TR4	Water Diversion	Diversion of water during construction	Variable during season. Dewatering accounted for each individual structure and for diversion channel: \$8M for reservoir, \$9M for WAF and additional for each additional feature. Pumping action needed to keep site dry during construction. Unknown locations for release location. Could just flood the interior of the reservoir.	Possible	Marginal	Low	Unlikely	Negligible	Low
TR5	Slope Protection and Water Seepage During Construction	Slope protection and water seepage under the newly constructed levees before the soil cement has been installed	Slope protection and temporary seepage barrier may need to be constructed. Assume \$20M. Soil cement that is the final protection, not installed during construction. The areas for levee construction are not currently flooded or underwater. What is the source of this seepage?	Likely	Marginal	Medium	Unlikely	Negligible	Low
TR6	Aquifer Storage and Recovery (ASR) Design	Possible design change of the ASR	Conservatively design and estimate for the cost per pair of wells. Assuming 80 ASR wells currently. Good information at some of the locations, missing at others. May need to add additional wells. \$7M per pair of wells, 10% more wells may be needed, \$28M impact. Additional wells would be within existing state-owned lands. Possible credit if fewer wells are needed. Same 10%. Note that well-head sites still need to be designed.	Possible	Moderate	Medium	Unlikely	Negligible	Low
TR7	Restoration Plantings	Additional plantings included for restoration	Not part of the design, not anticipated because this is a wetland. Plantings associated with canal construction impact is below \$5M which is negligible.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
TR8	Reservoir Control Structures	Structure sizes may change based on further design refinements (eg. Climate Change considerations)	Structure data has been provided for the project, considered to be a conservative design and the largest that is anticipated. Sizes have been increased on many structures since the Alternative phase. \$96M of construction. Potential cost could vary, unlikely credit or increase, 5% is negligible.	Possible	Negligible	Low	Unlikely	Negligible	Low
TR9	Utilities	Relocations and New Utilities	Rural area, power is unknown. May need to increase power sources in the area to run control structures and ASR wells, or may require diesel control structures. Three phase power is available, but not necessarily high amperage. Would require miles of power lines. Use \$2M/mile for high voltage lines as a starting point. FP&L is usually undersized in rural areas. Schedule impact is coordination time with the utility.	Very Likely	Significant	High	Very Likely	Moderate	High
TR10	Floodwalls	Long term seepage under structures	Seepage canal and low height of levee control seepage in current design. Bentonite cutoff wall is not included, but could be required based on geotech data. Cutoff wall may also be required in some areas and not others.	Possible	Moderate	Medium	Unlikely	Negligible	Low
Lands and Damages (LD)									

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (\$)	Impact (\$)	Risk Level (\$)
LD1	Acquisition Timeline - Condemnation	Some parcels will require condemnation actions which may extend the acquisition timeline or require revised construction/contract acquisition sequencing to mitigate.	Lands purchased by the sponsor using HUD funds- completed or in process, and are not part of cost share. Captured in FWOP condition. 15% contingency is included in the current estimate of \$400k for admin costs. Risk of condemnation impact over 15 months is low.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
LD2	Project Footprint	More likely to shrink the footprint	Paradise Run footprint could be reduced, see EX-1. Potential credit of \$4k per acre, about 200 acres. Project expansion is very unlikely, this is a conservatively designed project.	Possible	Negligible	Low	Unlikely	Negligible	Low
Regulatory Environmental Risks (RG)									
RG1	Cultural Sites	There are multiple known sites that plans are currently working around.	Cultural sites are prevalent in the work area and may be discovered as design work and site investigations proceed. Some areas are mapped, others are not. High likelihood on private lands. Newly discovered sites may restrict some of the assumed haul routes and staging areas. Could be potential credit if an area is avoided. Levee alignment could change resulting in reduced overall length. But the sum total of all cultural sites is very unlikely to yield a credit. Need to finish Real Estate procurement before the cultural study can be done. Permanent protection may be required for cultural sites if discovered.	Very Likely	Moderate	High	Very Likely	Marginal	Medium
RG2	Endangered Species and Special Status Species	Known endangered species exist, will require habitat mitigation or relocation	There are several endangered species. Not in base estimate.	Very Likely	Marginal	Medium	Very Likely	Marginal	Medium
RG3	Permitting Process for Contractor Plans	Many of the contractor's plans will require outside permitting by other agencies.	Local/state permits considered normal part of work such as hauling and discharge permits.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
RG4	Negative Community Impacts	Species migration	Endangered species migrating to private landowner properties would be a headache, but no financial or schedule impact.	Likely	Negligible	Low	Likely	Negligible	Low
RG5	Environmental Clearance	A Finding of No Significant Impact (FONSI) will be required for each contract in order to proceed.	No impact expected.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
RG6	State Historical Preservation Office Concurrence	SHPO Concurrence will be required prior to contract solicitation. USACE has been in consultation with SHPO.	Awaiting SHPO survey. No impact expected.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
RG7	Noise Restrictions	Construction noise restrictions could impact schedule	No noise restrictions during daylight hours. Construction exempt sunrise to sunset 7 days a week.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
RG8	Coffer Dam Plan Approval	Coffer dam plan- Constructability	Dewater around each individual structure. River will stay in main channel during construction Agencies may require dewatering plan. (NDGF/Dept of Health). No impacts anticipated for permitting.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
RG9	Larval Entrainment	Larval entrainment for well intakes and pump station intakes	Design well screens to be of adequate depth or at bottom of canal. Well screens need to be designed to prevent entrapment of fish larvae. See risk RG10 Water Quality Issues below.	Likely	Negligible	Low	Unlikely	Negligible	Low

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (\$)	Impact (\$)	Risk Level (\$)
RG10	Water Quality Issues	Water quality standards for release from ASR wells	Could be filtration system that meets all water quality standards for the ASR wells. Potential of \$1M per well pair for adequate screen/filter. There are also alternatives, this is the most expensive.No schedule impacts as this can be handled during normal design phase.	Possible	Significant	Medium	Unlikely	Negligible	Low
RG11	ASR Discharge Permitting	Water discharge permitting for ASRs	Uncertainty with permitting the ASR system. Schedule impact could be 2 years. Modeled with risk EX1 Sponsor/Stakeholder Requests below.	Possible	Negligible	Low	Possible	Moderate	Medium
RG12	Regulation Changes	Water quality standards could change	Both ground water and surface water impacts could the project. Consider this covered in risk RG11 ASR Discharge Permitting, which is modeled with risk EX1 Sponsor/Stakeholder Requests.	Possible	Marginal	Low	Possible	Marginal	Low
Construction Risks (CO)									
CO1	Accelerated Project Schedule	Priority changes resulting is an accelerated project schedule	This can happen as priorities change. The fully funded costs with the multi-decade schedule covers the risk of moving the project schedule up. No impact.	Possible	Negligible	Low	Unlikely	Negligible	Low
CO2	Construction Modifications	Typical rate of construction modifications for SAJ	Typical construction modifications for Jacksonville is 10%	Likely	Critical	High	Possible	Marginal	Low
CO3	Subcontractor Markups	Are subcontractor markups adequately considered in the estimate?	Already included in the estimate adequately.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
CO4	Multiple Contractors	If multiple contracts are let, can the site handle multiple prime contractors?	The site is large and would not be an issue normally. If project schedule is rushed then this could possibly impact the schedule. Enough float in the schedule than no impact is anticipated.	Possible	Marginal	Low	Unlikely	Negligible	Low
CO5	Site Access	Could be increased cost due to site access, such as access roads	This could be an impact, but with a long schedule this is less likely. 25 miles of levee, xx miles of canals, etc. This is a large area. Possible that one contractor could have the cost of an access road that is used by other contractors. Would then need to be accounted for.	Possible	Marginal	Low	Unlikely	Negligible	Low
Estimate and Schedule Risks (ES)									
ES1	Fuel Variations	Fuel cost has varied significantly recently and will most likely continue to fluctuate for the life of this project.	Risk - long-term fluctuation of fuel prices from the escalated norm going several decades out. Could swing \$1.25/gal higher or \$0.50/gal lower from this escalated norm with a usage of 13.3M gallons of fuel.	Likely	Marginal	Medium	Unlikely	Negligible	Low
ES2	Local Escalation Rates Greater than National Average	Potential for higher construction escalation than the allowable adjustment provided with CWCCIS index. The risk for a higher construction spike is considered low for this project	CWCCIS tables have been updated to include a 3% yearly escalation. Escalation could be 1/4% higher per year.	Likely	Moderate	Medium	Unlikely	Negligible	Low

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (S)	Impact (S)	Risk Level (S)
ES3	Variations in Quantities	As design continues to evolve, quantities will fluctuate.	<p>Levee elevations - Current elevations based on LiDAR. Less than 1/2 foot variance in quantities. If borrow areas or material changed.</p> <p>Diversion channel excavation quantities - Accurate.</p> <p>In place quantities - ECY used, swell factor included, haul routes included, onsite material used.</p> <p>Storm change of the landscape is unlikely.</p>	Possible	Moderate	Medium	Unlikely	Negligible	Low
ES4	Production Rates	Estimates carry uncertainty inherent with any cost estimates. Crews, assemblies, productivities, and methodologies in the current estimate, while acceptable and reasonable, may not adequately capture ultimate actual contractor technique and costs.	Confident on production rates. Productivity rates were developed, 75% efficiency used for excavation as an example. Crews are well developed.	Possible	Marginal	Low	Unlikely	Negligible	Low
ES5	Level of Estimate	Estimates are currently Class 4 parametric estimates. Estimates will be Class 3 level estimates for the final report.	Class 3 for final report.	Likely	Marginal	Medium	Unlikely	Negligible	Low
ES6	Level of construction Schedule	Schedule is a feasibility level of construction schedule that doesn't have a firm critical path, built in float, weather delays, etc.	<p>Schedule is funding driven, not critical construction path. Lots of float already built in.</p> <p>Individual contracts are already separated and historical durations are used as the basis.</p> <p>Risk discussion...</p>	Unlikely	Negligible	Low	Unlikely	Negligible	Low
ES6	Davis Bacon WR	Wage rates used in the estimate, Davis Bacon is the required wage rate	<p>Right to work state. Davis Bacon is usually higher than the local average but lower than the union average.</p> <p>Florida cost library is used, typical for Jacksonville projects.</p>	Unlikely	Negligible	Low	Unlikely	Negligible	Low
External Risks (EX)									
EX1	Sponsor / Stakeholder Requests	Tribal coordination, Buckhead Ridge and Glade County (local communities), landowners	Paradise Run footprint will be reduced because of request from county.WAF will not change footprint based on Glades County request. Seminole Tribe requests may still impact this.Additional rec facilities may be higher than the \$10M in the estimate. Multiple access points per location is anticipated.Potential change to footprint change and potential impacts to schedule due to conditional support from non-federal sponsor.SR78 may need to be elevated due to proximity to project, as it is a hurricane evacuation route. 7 miles could potentially be impacted, likely is 3 miles of impact.Adjacent landowner concerns such as seepage and levee breach risk.	Likely	Significant	High	Very Likely	Marginal	Medium
EX2	Litigation	Potential lawsuit to stop the project by the Seminole Tribe.	2-3 year potential delay. Will impact that year's budget of PED and current contracts.	Very Likely	Marginal	Medium	Very Likely	Marginal	Medium

CREF	Risk/Opportunity Event	Risk Event Description	PDT Discussions on Impact and Likelihood	Project Cost			Project Schedule		
				Likelihood ©	Impact ©	Risk Level ©	Likelihood (\$)	Impact (\$)	Risk Level (\$)
			<p>Litigation ability is limited to pre-authorization processes only. After authorization litigation risk is negligible.</p> <p>The tribe has been letter writing already and it is anticipated that this will head to litigation to stop the project.</p>						
EX3	Consideration for Low and Unknown Risk	There is inherent risk in all projects that could contribute to cost and schedule variance due to unknowns.	No additional inherent risks are modeled.	Unlikely	Negligible	Low	Unlikely	Negligible	Low
EX4	Lake Okeechobee Regulation Schedule (LORS)	A change in operating basis could affect the project.	LORS will change in the next few years. May lower lake required operational level that would reduce the necessity for this project as this would mean more storage is available in the lake. There is a potential credit of a feature of work (potential of WAF removal \$624M). Hydrology currently working on this, available Jan. This is such a large \$\$ not modeled as it would significantly alter the project. Significant reduction in LORS operating requirements would result in a new project. Fundamental change in project is outside of the scope of this study and not included in this model. Change in LORS would require a new plan formulation. An increase in LORS operating requirements would result in an increase of project cost.	Possible	Critical	High	Possible	Critical	High
EX5	Priority Change	Priority change at the local level (other than Federal priority change)	State Legislators could change priorities to other projects due to many factors such as funding, priorities, lawsuits, etc.	Possible	Negligible	Low	Possible	Significant	Medium
EX6	Availability of Labor	Employees from local area	<p>ASR is deep drilling injection wells (1k feet deep +), qualified contractors may be rare.</p> <p>This is a large project that will impact the local labor market.</p> <p>Critical assumption is only 4-6 wells per year. Would be large impact if an accelerated schedule is implemented. This is not considered as a possibility.</p>	Possible	Negligible	Low	Unlikely	Negligible	Low
EX7	Acts of God (Hurricane)	Hurricane effects and potential impacts.	More of an impact during construction. Paradise Run impact would be schedule delay (cost is \$69M). Reservoir impact would be delay and damage (cost is \$401M). Include cost for multiple contractor mob-demob.	Possible	Moderate	Medium	Likely	Marginal	Medium

B.3.2.2 Project and Schedule Contingency Development

Lake Okeechobee Watershed Restoration
5-Dec-18

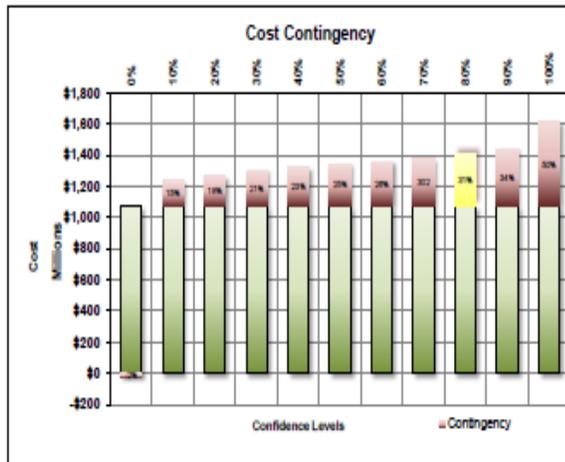
Contingency on Base Estimate		80% Confidence Project Cost
Base Construction Estimate		\$1,077,020,000
Baseline Estimate Cost Contingency Amount ->	\$333,876,200	31%
Baseline Estimate Construction Cost (80% Confidence) ->	\$1,410,896,200	

Contingency on Schedule		80% Confidence Project Schedule
Project Base Schedule Duration ->	306.1 Months	
Schedule Contingency Duration ->	85.4 Months	28%
Project Schedule Duration (80% Confidence) ->	390.8 Months	

- PROJECT CONTINGENCY DEVELOPMENT -

**INITIAL CONSTRUCTION
Contingency Analysis**

Base Case Estimate (Excluding 01)		\$1,077,020,000
Confidence Level	Contingency Value	Contingency
0%	-21,640,400	-2%
10%	181,663,000	16%
20%	188,883,800	18%
30%	228,174,200	21%
40%	247,714,800	23%
50%	268,266,000	26%
60%	280,026,200	26%
70%	301,686,800	28%
80%	333,876,200	31%
90%	368,188,800	34%
100%	638,610,000	60%

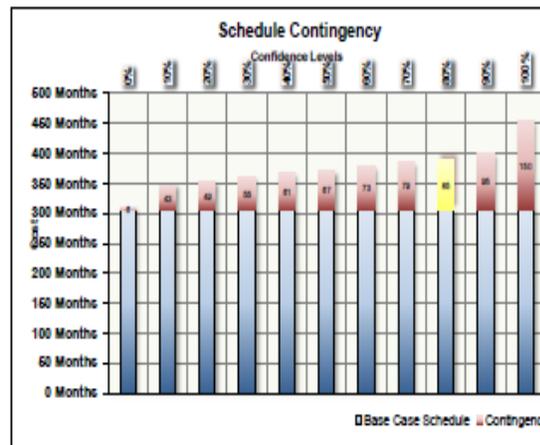


Lake Okeechobee Watershed Restoration
5-Dec-18

- SCHEDULE CONTINGENCY (DURATION) DEVELOPMENT -

Contingency Analysis

Base Case Schedule		306.1 Months
Confidence Level	Contingency Value	Contingency
0%	8 Months	2%
10%	43 Months	14%
20%	48 Months	16%
30%	66 Months	18%
40%	81 Months	20%
50%	87 Months	22%
60%	73 Months	24%
70%	79 Months	26%
80%	85 Months	28%
90%	96 Months	31%
100%	160 Months	48%

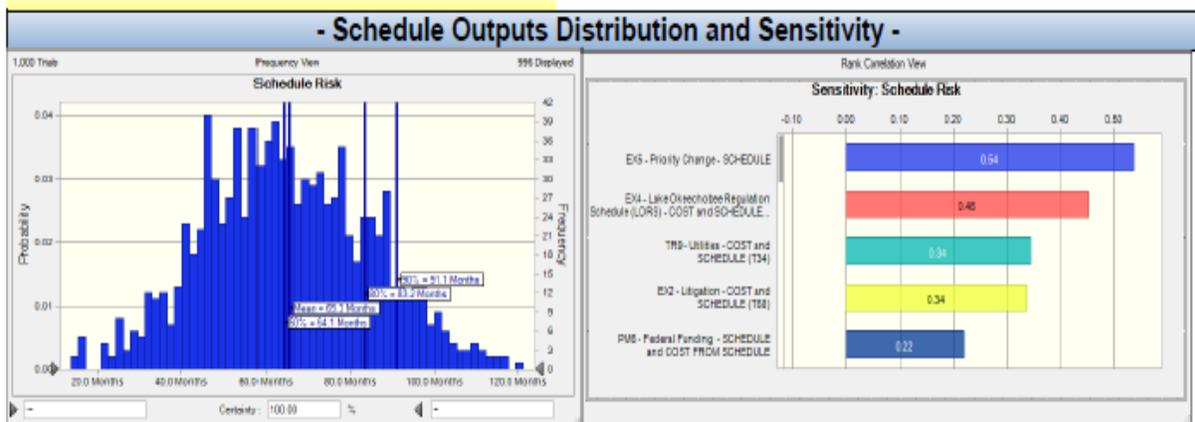
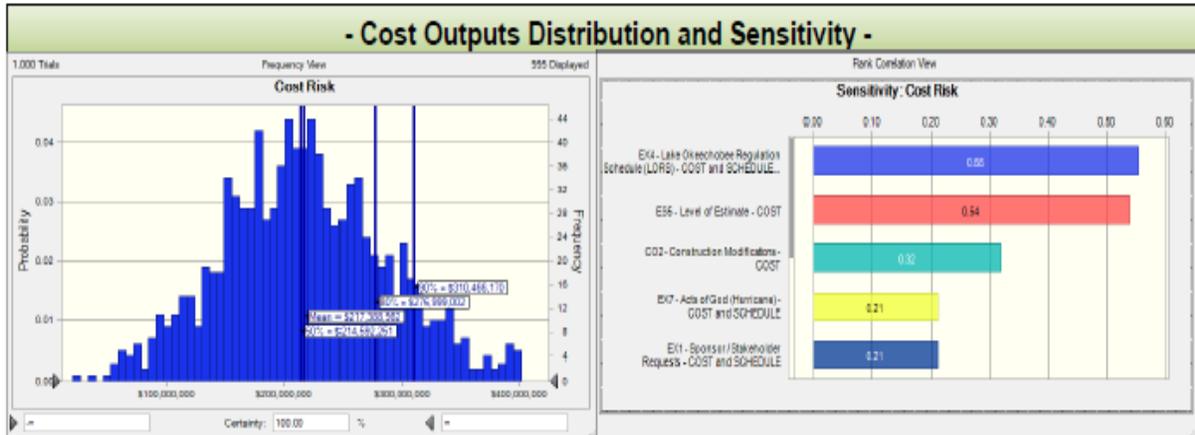


B.3.2.3 Cost and Schedule Outputs Distribution and Sensitivity

Lake Okeechobee Watershed Restoration
5-Dec-18

Contingency on Base Estimate		
Base Construction Estimate	\$1,077,020,000	
Baseline Estimate Cost Contingency Amount ->	\$333,876,200	31%
Baseline Estimate Construction Cost (80% Confidence) ->	\$1,410,896,200	

Contingency on Schedule		
Project Base Schedule Duration ->	306.1 Months	
Schedule Contingency Duration ->	85.4 Months	28%
Project Schedule Duration (80% Confidence) ->	390.8 Months	



The P80 level is the contingency value most commonly reported for programming and management purposes within USACE. These results reflect contingencies based on both the cost and schedule risk analyses.

B.5 TOTAL PROJECT COST SUMMARY

The Total Project Cost Summary (TPCS) addresses inflation through project completion (accomplished by escalation to mid-point of construction per ER 1110-2-1302, Appendix C, Page C-2). It is based on the scope of the Recommended Plan and the project schedule. The TPCS includes Federal and non-Federal costs for lands and damages, all construction features, PED, and S&A, along with the appropriate contingencies and escalation associated with each of these activities.

The TPCS is formatted according to the WBS and uses Civil Works Construction Cost Indexing System factors for escalation (EM 1110-2-1304) of construction costs and Office of Management and Budget (EC 11-2-18X, 30 September 2010) factors for escalation of PED and S&A costs.

Table B-3 is the Total Project Cost Summary prepared using the MCACES/MII cost estimate on the Recommended Plan with contingencies set by the risk analysis (and the exceptions as described above) and the official project schedule.

B.5.1 COST AGENCY TECHNICAL REVIEW CERTIFICATION**WALLA WALLA COST ENGINEERING
MANDATORY CENTER OF EXPERTISE****COST AGENCY TECHNICAL REVIEW****CERTIFICATION STATEMENT**

For Project No. 114447

SAJ – Lake Okeechobee Watershed Project (LOWP)

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

As of April 24, 2019, the Cost MCX certifies the estimated total project cost:

FY20 Project First Cost: \$1,963,959,000
Fully Funded Amount: \$3,481,322,000

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



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Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

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B.5.2 TOTAL PROJECT COST SUMMARY (TPCS)

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

Printed:4/22/2019
Page 1 of 10

PROJECT: Lake Okeechobee Watershed
PROJECT NC 14447
LOCATION: Florida

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham
PREPARED: 4/19/2019

This Estimate reflects the scope and schedule in report; Lake Okeechobee Watershed PIR

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): Effective Price Level Date: 2020 1 OCT 19		INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
										Spent Thru: 1-Oct-18 (\$K) K	TOTAL FIRST COST (\$K) K				
03	RESERVOIRS	\$466,743	\$141,590	31.0%	\$598,333	2.5%	\$468,345	\$145,187	\$613,532	\$0	\$613,532	82.9%	\$866,477	\$265,508	\$1,121,985
09	CHANNELS & CANALS	\$146,835	\$45,519	31.0%	\$192,354	2.5%	\$150,565	\$46,675	\$197,240	\$0	\$197,240	72.2%	\$259,331	\$80,393	\$339,723
11	LEVEES & FLOODWALLS	\$435	\$135	31.0%	\$570	2.5%	\$446	\$138	\$584	\$0	\$584	31.4%	\$586	\$182	\$767
13	PUMPING PLANT	\$373,081	\$116,855	31.0%	\$489,936	2.5%	\$382,558	\$118,593	\$501,150	\$0	\$501,150	70.9%	\$653,762	\$202,666	\$856,428
14	RECREATION FACILITIES	\$1,987	\$616	31.0%	\$2,603	2.5%	\$2,037	\$632	\$2,669	\$0	\$2,669	111.1%	\$4,301	\$1,333	\$5,634
15	FLOODWAY CONTROL & DIVERSION STRU	\$94,610	\$29,329	31.0%	\$123,939	2.5%	\$97,013	\$30,074	\$127,087	\$0	\$127,087	61.6%	\$156,816	\$48,613	\$205,429
19	BUILDINGS, GROUNDS & UTILITIES	\$3,764	\$1,167	31.0%	\$4,931	2.5%	\$3,860	\$1,197	\$5,056	\$0	\$5,056	83.3%	\$7,074	\$2,193	\$9,267
CONSTRUCTION ESTIMATE TOTALS:		\$1,077,455	\$334,011		\$1,411,466	2.5%	\$1,104,823	\$342,495	\$1,447,319	\$0	\$1,447,319	75.4%	\$1,938,346	\$600,887	\$2,539,234
01	LANDS AND DAMAGES	\$96,904	\$38,762	40.0%	\$135,666	2.5%	\$99,366	\$39,746	\$139,112	\$0	\$139,112	16.8%	\$116,022	\$46,409	\$162,431
30	PLANNING, ENGINEERING & DESIGN	\$169,699	\$52,607	31.0%	\$222,306	3.9%	\$176,271	\$54,644	\$230,915	\$0	\$230,915	104.3%	\$360,108	\$111,634	\$471,742
31	CONSTRUCTION MANAGEMENT	\$107,746	\$33,401	31.0%	\$141,147	3.9%	\$111,918	\$34,695	\$146,613	\$0	\$146,613	110.0%	\$235,050	\$72,866	\$307,916
PROJECT COST TOTALS:		\$1,451,804	\$458,781	31.6%	\$1,910,585		\$1,492,379	\$471,580	\$1,963,959	\$0	\$1,963,959	77.3%	\$2,649,527	\$831,795	\$3,481,322

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CHIEF, COST ENGINEERING, Matthew Cunningham

ESTIMATED TOTAL PROJECT COST: \$3,481,322

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PROJECT MANAGER, Timothy E Gysan

CHIEF, REAL ESTATE, Tim McQuillen

CHIEF, PLANNING, Eric Summa

CHIEF, ENGINEERING, Laureen Borochaner

CHIEF, OPERATIONS, Carol Bemstein

ACTING CHIEF, CONSTRUCTION, Eric Arndt

CHIEF, CONTRACTING, Ronnell Booker

CHIEF, PM-PB, Karen Smith

CHIEF, DPM, Tim Murphy

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report; Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham
PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	RISK BASED				ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F									
13	(ASR at Kissimmee Basin - Contract 1) PUMPING PLANT	\$45,767	\$14,188	31.0%	\$59,954	2.5%	\$48,929	\$14,548	\$61,477	2027Q3	24.8%	\$58,570	\$18,157	\$76,727
CONSTRUCTION ESTIMATE TOTALS:		\$45,767	\$14,188	31.0%	\$59,954		\$48,929	\$14,548	\$61,477			\$58,570	\$18,157	\$76,727
01	LANDS AND DAMAGES	\$81	\$32	40.0%	\$113	2.5%	\$83	\$33	\$116	2025Q2	18.8%	\$97	\$39	\$135
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$229	\$71	31.0%	\$300	3.0%	\$238	\$74	\$311	2024Q2	18.0%	\$278	\$86	\$364
0.5%	Planning & Environmental Compliance	\$229	\$71	31.0%	\$300	3.0%	\$238	\$74	\$311	2024Q2	18.0%	\$278	\$86	\$364
4.0%	Engineering & Design	\$1,831	\$568	31.0%	\$2,398	3.0%	\$1,902	\$589	\$2,491	2024Q2	18.0%	\$2,224	\$689	\$2,913
1.0%	Reviews, ATRs, IEPRs, VE	\$458	\$142	31.0%	\$600	3.0%	\$475	\$147	\$623	2024Q2	18.0%	\$556	\$172	\$728
0.3%	Life Cycle Updates (cost, schedule, risks)	\$137	\$43	31.0%	\$180	3.0%	\$143	\$44	\$187	2024Q2	18.0%	\$167	\$52	\$218
0.2%	Contracting & Reprographics	\$69	\$21	31.0%	\$90	3.0%	\$71	\$22	\$93	2024Q2	18.0%	\$83	\$26	\$109
4.0%	Engineering During Construction	\$1,831	\$568	31.0%	\$2,398	3.0%	\$1,902	\$589	\$2,491	2027Q3	31.0%	\$2,509	\$778	\$3,286
1.0%	Planning During Construction	\$458	\$142	31.0%	\$600	3.0%	\$475	\$147	\$623	2027Q3	31.0%	\$627	\$194	\$822
4.0%	Adaptive Management & Monitoring	\$1,831	\$568	31.0%	\$2,398	3.0%	\$1,902	\$589	\$2,491	2031Q4	55.3%	\$2,063	\$915	\$3,869
0.3%	Project Operations	\$137	\$43	31.0%	\$180	3.0%	\$143	\$44	\$187	2024Q2	18.0%	\$167	\$52	\$218
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$3,061	\$1,135	31.0%	\$4,796	3.0%	\$3,803	\$1,179	\$4,982	2027Q3	31.0%	\$5,017	\$1,555	\$6,573
1.0%	Project Operation:	\$458	\$142	31.0%	\$600	3.0%	\$475	\$147	\$623	2027Q3	31.0%	\$627	\$194	\$822
1.0%	Project Management	\$458	\$142	31.0%	\$600	3.0%	\$475	\$147	\$623	2027Q3	31.0%	\$627	\$194	\$822
CONTRACT COST TOTALS:		\$57,632	\$17,873		\$75,505		\$59,253	\$18,376	\$77,629			\$74,780	\$23,190	\$97,970

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report:

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level:		15-Apr-19 1-Oct-18	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O	
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E		ESC (%) G	COST (\$K) H	CNTG (\$K) I						TOTAL (\$K) J
13	(ASR at Taylor Creek/Nubbling Slough Basin - Contract 2) PUMPING PLANT	\$38,728	\$12,005	31.0%	\$50,730	2.5%	\$39,709	\$12,310	\$52,019	2030Q4	37.4%	\$54,559	\$16,913	\$71,473
CONSTRUCTION ESTIMATE TOTALS:		\$38,728	\$12,005	31.0%	\$50,730		\$39,709	\$12,310	\$52,019			\$54,559	\$16,913	\$71,473
01	LANDS AND DAMAGES	\$81	\$32	40.0%	\$113	2.5%	\$83	\$33	\$116	2025Q2	16.8%	\$97	\$39	\$135
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$194	\$80	31.0%	\$254	3.0%	\$201	\$82	\$263	2028Q4	38.4%	\$278	\$86	\$365
0.5%	Planning & Environmental Compliance	\$194	\$80	31.0%	\$254	3.0%	\$201	\$82	\$263	2028Q4	38.4%	\$278	\$86	\$365
4.0%	Engineering & Design	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,609	\$499	\$2,108	2028Q4	38.4%	\$2,227	\$690	\$2,917
1.0%	Reviews, ATRs, IEPs, VE	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2028Q4	38.4%	\$567	\$173	\$729
0.3%	Life Cycle Updates (cost, schedule, risks)	\$118	\$36	31.0%	\$152	3.0%	\$121	\$37	\$158	2028Q4	38.4%	\$167	\$52	\$219
0.2%	Contracting & Reprographics	\$58	\$18	31.0%	\$76	3.0%	\$60	\$19	\$79	2028Q4	38.4%	\$84	\$26	\$109
4.0%	Engineering During Construction	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,609	\$499	\$2,108	2030Q4	49.4%	\$2,404	\$745	\$3,149
1.0%	Planning During Construction	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2030Q4	49.4%	\$601	\$186	\$787
4.0%	Adaptive Management & Monitoring	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,609	\$499	\$2,108	2034Q4	74.7%	\$2,811	\$871	\$3,682
0.3%	Project Operations	\$118	\$36	31.0%	\$152	3.0%	\$121	\$37	\$158	2028Q4	38.4%	\$167	\$52	\$219
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$3,088	\$980	31.0%	\$4,058	3.0%	\$3,218	\$988	\$4,216	2030Q4	49.4%	\$4,808	\$1,490	\$6,298
1.0%	Project Operation:	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2030Q4	49.4%	\$601	\$186	\$787
1.0%	Project Management	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2030Q4	49.4%	\$601	\$186	\$787
CONTRACT COST TOTALS:		\$48,778	\$15,128		\$63,907		\$50,150	\$15,554	\$65,704			\$70,239	\$21,783	\$92,022

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report,

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level:		15-Apr-19 1-Oct-18	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E		ESC (%) G	COST (\$K) H	CNTG (\$K) I						
13	(ASR at Port Mayaca - Contract 3) PUMPING PLANT	\$38,726	\$12,005	31.0%	\$50,730	2.5%	\$39,709	\$12,310	\$52,019	2033Q3	49.0%	\$50,176	\$18,345	\$77,521
CONSTRUCTION ESTIMATE TOTALS:		\$38,726	\$12,005	31.0%	\$50,730		\$39,709	\$12,310	\$52,019			\$50,176	\$18,345	\$77,521
01	LANDS AND DAMAGES	\$81	\$32	40.0%	\$113	2.5%	\$83	\$33	\$116	2025Q2	16.8%	\$97	\$39	\$135
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$194	\$60	31.0%	\$254	3.9%	\$201	\$62	\$263	2031Q3	53.8%	\$309	\$96	\$405
0.5%	Planning & Environmental Compliance	\$194	\$60	31.0%	\$254	3.9%	\$201	\$62	\$263	2031Q3	53.8%	\$309	\$96	\$405
4.0%	Engineering & Design	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,809	\$499	\$2,308	2031Q3	53.8%	\$2,474	\$767	\$3,241
1.0%	Reviews, ATRs, IEPRs, VE	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2031Q3	53.8%	\$619	\$192	\$811
0.3%	Life Cycle Updates (cost, schedule, risks)	\$116	\$36	31.0%	\$152	3.9%	\$121	\$37	\$158	2031Q3	53.8%	\$188	\$58	\$243
0.2%	Contracting & Reprographics	\$58	\$18	31.0%	\$76	3.9%	\$60	\$19	\$79	2031Q3	53.8%	\$93	\$29	\$122
4.0%	Engineering During Construction	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,809	\$499	\$2,308	2033Q3	66.3%	\$2,676	\$830	\$3,506
1.0%	Planning During Construction	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2033Q3	66.3%	\$669	\$207	\$876
4.0%	Adaptive Management & Monitoring	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,809	\$499	\$2,308	2037Q3	95.0%	\$3,138	\$973	\$4,111
0.3%	Project Operations	\$116	\$36	31.0%	\$152	3.9%	\$121	\$37	\$158	2031Q3	53.8%	\$188	\$58	\$243
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$3,098	\$960	31.0%	\$4,058	3.9%	\$3,218	\$998	\$4,216	2033Q3	66.3%	\$5,353	\$1,659	\$7,012
1.0%	Project Operation:	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2033Q3	66.3%	\$669	\$207	\$876
1.0%	Project Management	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2033Q3	66.3%	\$669	\$207	\$876
CONTRACT COST TOTALS:		\$48,778	\$15,128		\$63,907		\$50,150	\$15,554	\$65,704			\$78,622	\$23,762	\$100,384

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report;

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: 15-Apr-19 Effective Price Level: 1-Oct-18		TOTAL (\$K) F	Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE					
		COST (\$K) C	CNTG (\$K) D		CNTG (%) E	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
13	(ASR at Moore Haven - Contract 4) PUMPING PLANT	\$38,728	\$12,005	31.0%	\$50,730	2.5%	\$39,709	\$12,310	\$52,019	2036Q2	81.6%	\$84,181	\$19,896	\$84,077
CONSTRUCTION ESTIMATE TOTALS:		\$38,728	\$12,005	31.0%	\$50,730		\$39,709	\$12,310	\$52,019			\$84,181	\$19,896	\$84,077
01	LANDS AND DAMAGES	\$81	\$32	40.0%	\$113	2.5%	\$83	\$33	\$116	2025Q2	16.8%	\$97	\$39	\$135
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$194	\$80	31.0%	\$254	3.0%	\$201	\$82	\$283	2034Q2	71.3%	\$344	\$107	\$451
0.5%	Planning & Environmental Compliance	\$104	\$80	31.0%	\$254	3.0%	\$201	\$82	\$283	2034Q2	71.3%	\$344	\$107	\$451
4.0%	Engineering & Design	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,809	\$499	\$2,108	2034Q2	71.3%	\$2,756	\$854	\$3,610
1.0%	Reviews, ATRs, IEPRs, VE	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2034Q2	71.3%	\$889	\$214	\$903
0.3%	Life Cycle Updates (cost, schedule, risks)	\$116	\$36	31.0%	\$152	3.0%	\$121	\$37	\$158	2034Q2	71.3%	\$207	\$64	\$271
0.2%	Contracting & Reprographics	\$68	\$18	31.0%	\$76	3.0%	\$60	\$19	\$79	2034Q2	71.3%	\$103	\$32	\$135
4.0%	Engineering During Construction	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,809	\$499	\$2,108	2036Q2	85.4%	\$2,983	\$925	\$3,908
1.0%	Planning During Construction	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2036Q2	85.4%	\$746	\$231	\$977
4.0%	Adaptive Management & Monitoring	\$1,549	\$480	31.0%	\$2,029	3.0%	\$1,809	\$499	\$2,108	2040Q2	118.2%	\$3,510	\$1,088	\$4,599
0.3%	Project Operations	\$116	\$36	31.0%	\$152	3.0%	\$121	\$37	\$158	2034Q2	71.3%	\$207	\$64	\$271
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$3,068	\$980	31.0%	\$4,058	3.0%	\$3,218	\$988	\$4,216	2036Q2	85.4%	\$5,987	\$1,850	\$7,817
1.0%	Project Operation:	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2036Q2	85.4%	\$746	\$231	\$977
1.0%	Project Management	\$387	\$120	31.0%	\$507	3.0%	\$402	\$125	\$527	2036Q2	85.4%	\$746	\$231	\$977
CONTRACT COST TOTALS:		\$48,778	\$15,128		\$63,907		\$50,150	\$15,554	\$65,704			\$83,626	\$25,933	\$109,559

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report;

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: 15-Apr-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
13	(ASR at Indian Prairie - Contract 5) PUMPING PLANT	\$38,726	\$12,005	31.0%	\$50,730	2.5%	\$39,709	\$12,310	\$52,019	2039Q2	76.6%	\$70,132	\$21,741	\$91,873
CONSTRUCTION ESTIMATE TOTALS:		\$38,726	\$12,005	31.0%	\$50,730		\$39,709	\$12,310	\$52,019			\$70,132	\$21,741	\$91,873
01	LANDS AND DAMAGES	\$81	\$32	40.0%	\$113	2.5%	\$83	\$33	\$116	2025Q2	16.8%	\$97	\$39	\$135
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$194	\$60	31.0%	\$254	3.9%	\$201	\$62	\$263	2037Q1	91.1%	\$384	\$119	\$504
0.5%	Planning & Environmental Compliance	\$194	\$60	31.0%	\$254	3.9%	\$201	\$62	\$263	2037Q1	91.1%	\$384	\$119	\$504
4.0%	Engineering & Design	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,609	\$499	\$2,108	2037Q1	91.1%	\$3,075	\$953	\$4,029
1.0%	Reviews, ATRs, IEPs, VE	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2037Q1	91.1%	\$789	\$238	\$1,007
0.3%	Life Cycle Updates (cost, schedule, risks)	\$116	\$36	31.0%	\$152	3.9%	\$121	\$37	\$158	2037Q1	91.1%	\$231	\$71	\$302
0.2%	Contracting & Reprographics	\$58	\$18	31.0%	\$76	3.9%	\$60	\$19	\$79	2037Q1	91.1%	\$115	\$36	\$151
4.0%	Engineering During Construction	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,609	\$499	\$2,108	2039Q2	109.4%	\$3,389	\$1,044	\$4,413
1.0%	Planning During Construction	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2039Q2	109.4%	\$842	\$261	\$1,103
4.0%	Adaptive Management & Monitoring	\$1,549	\$480	31.0%	\$2,029	3.9%	\$1,609	\$499	\$2,108	2043Q1	144.3%	\$3,832	\$1,219	\$5,150
0.3%	Project Operations	\$116	\$36	31.0%	\$152	3.9%	\$121	\$37	\$158	2037Q1	91.1%	\$231	\$71	\$302
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$3,098	\$960	31.0%	\$4,058	3.9%	\$3,218	\$998	\$4,216	2039Q2	109.4%	\$6,738	\$2,089	\$8,827
1.0%	Project Operation:	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2039Q2	109.4%	\$842	\$261	\$1,103
1.0%	Project Management	\$387	\$120	31.0%	\$507	3.9%	\$402	\$125	\$527	2039Q2	109.4%	\$842	\$261	\$1,103
CONTRACT COST TOTALS:		\$48,778	\$15,128		\$63,907		\$50,150	\$15,554	\$65,704			\$91,983	\$28,523	\$120,506

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report; Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham
PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: 15-Apr-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
03	RESERVOIRS	\$14,727	\$4,565	31.0%	\$19,292	2.5%	\$15,101	\$4,681	\$19,783	2028Q4	29.5%	\$10,558	\$6,063	\$25,620
09	CHANNELS & CANALS	\$16,880	\$5,233	31.0%	\$22,113	2.5%	\$17,309	\$5,366	\$22,674	2029Q2	31.4%	\$22,748	\$7,051	\$29,798
11	LEVEES & FLOODWALLS	\$435	\$135	31.0%	\$570	2.5%	\$446	\$138	\$584	2029Q2	31.4%	\$586	\$182	\$767
13	PUMPING PLANT	\$11,500	\$3,565	31.0%	\$15,065	2.5%	\$11,792	\$3,656	\$15,448	2029Q4	33.4%	\$15,730	\$4,876	\$20,607
14	RECREATION FACILITIES	\$66	\$20	31.0%	\$86	2.5%	\$68	\$21	\$89	2032Q4	45.8%	\$99	\$31	\$129
15	FLOODWAY CONTROL & DIVERSION STRU	\$28,451	\$8,820	31.0%	\$37,271	2.5%	\$29,174	\$9,044	\$38,217	2031Q1	38.4%	\$40,368	\$12,514	\$52,882
CONSTRUCTION ESTIMATE TOTALS:		\$72,059	\$22,338	31.0%	\$94,397		\$73,889	\$22,906	\$96,794			\$99,087	\$30,717	\$129,803
01	LANDS AND DAMAGES	\$18,300	\$7,320	40.0%	\$25,619	2.5%	\$18,764	\$7,506	\$26,270	2025Q2	16.8%	\$21,910	\$8,764	\$30,674
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$360	\$112	31.0%	\$472	3.9%	\$374	\$116	\$490	2027Q1	29.5%	\$494	\$150	\$635
0.5%	Planning & Environmental Compliance	\$360	\$112	31.0%	\$472	3.9%	\$374	\$116	\$490	2027Q1	29.5%	\$494	\$150	\$635
4.0%	Engineering & Design	\$2,882	\$894	31.0%	\$3,776	3.9%	\$2,994	\$928	\$3,922	2027Q1	29.5%	\$3,876	\$1,202	\$5,077
1.0%	Reviews, ATRs, IEPRs, VE	\$721	\$223	31.0%	\$944	3.9%	\$748	\$232	\$981	2027Q1	29.5%	\$969	\$300	\$1,269
0.3%	Life Cycle Updates (cost, schedule, risks)	\$216	\$67	31.0%	\$283	3.9%	\$225	\$70	\$294	2027Q1	29.5%	\$291	\$90	\$381
0.2%	Contracting & Reprographics	\$108	\$34	31.0%	\$142	3.9%	\$112	\$35	\$147	2027Q1	29.5%	\$145	\$45	\$190
4.0%	Engineering During Construction	\$2,882	\$894	31.0%	\$3,776	3.9%	\$2,994	\$928	\$3,922	2030Q4	49.4%	\$4,473	\$1,387	\$5,860
1.0%	Planning During Construction	\$721	\$223	31.0%	\$944	3.9%	\$748	\$232	\$981	2030Q4	49.4%	\$1,118	\$347	\$1,465
4.0%	Adaptive Management & Monitoring	\$2,882	\$894	31.0%	\$3,776	3.9%	\$2,994	\$928	\$3,922	2032Q4	61.5%	\$4,836	\$1,499	\$6,335
0.3%	Project Operations	\$216	\$67	31.0%	\$283	3.9%	\$225	\$70	\$294	2027Q1	29.5%	\$291	\$90	\$381
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$5,765	\$1,787	31.0%	\$7,552	3.9%	\$5,988	\$1,856	\$7,844	2030Q4	49.4%	\$8,046	\$2,773	\$11,719
1.0%	Project Operation:	\$721	\$223	31.0%	\$944	3.9%	\$748	\$232	\$981	2030Q4	49.4%	\$1,118	\$347	\$1,465
1.0%	Project Management	\$721	\$223	31.0%	\$944	3.9%	\$748	\$232	\$981	2030Q4	49.4%	\$1,118	\$347	\$1,465
CONTRACT COST TOTALS:		\$108,913	\$35,410		\$144,323		\$111,927	\$36,386	\$148,313			\$149,146	\$48,207	\$197,354

Filename: LOWP TPCS (Draft).xlsx
TPCS

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

Printed:4/22/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report; Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham
PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level: 15-Apr-19 1-Oct-18			Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE					
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
09	(Kissimmee River Center - Contract 7) CHANNELS & CANALS	\$9,997	\$3,099	31.0%	\$13,096	2.5%	\$10,251	\$3,178	\$13,428	2031Q4	41.5%	\$14,507	\$4,497	\$19,004
13	PUMPING PLANT	\$3,800	\$1,178	31.0%	\$4,978	2.5%	\$3,897	\$1,208	\$5,104	2032Q2	43.8%	\$5,598	\$1,735	\$7,330
14	RECREATION FACILITIES	\$22	\$7	31.0%	\$29	2.5%	\$23	\$7	\$30	2034Q1	51.2%	\$34	\$11	\$45
15	FLOODWAY CONTROL & DIVERSION STRU	\$5,824	\$1,805	31.0%	\$7,629	2.5%	\$5,971	\$1,851	\$7,823	2033Q1	46.8%	\$8,786	\$2,717	\$11,483
CONSTRUCTION ESTIMATE TOTALS:		\$19,642	\$6,089	31.0%	\$25,731		\$20,141	\$6,244	\$26,385			\$28,902	\$8,960	\$37,862
01	LANDS AND DAMAGES	\$6,214	\$2,485	40.0%	\$8,699	2.5%	\$6,371	\$2,549	\$8,920	2025Q2	16.8%	\$7,439	\$2,976	\$10,415
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$98	\$30	31.0%	\$129	3.9%	\$102	\$32	\$134	2029Q3	42.4%	\$145	\$45	\$190
0.5%	Planning & Environmental Compliance	\$98	\$30	31.0%	\$129	3.9%	\$102	\$32	\$134	2029Q3	42.4%	\$145	\$45	\$190
4.0%	Engineering & Design	\$788	\$244	31.0%	\$1,029	3.9%	\$818	\$253	\$1,099	2029Q3	42.4%	\$1,162	\$360	\$1,523
1.0%	Reviews, ATRs, IEPRs, VE	\$198	\$61	31.0%	\$257	3.9%	\$204	\$83	\$287	2029Q3	42.4%	\$291	\$90	\$381
0.3%	Life Cycle Updates (cost, schedule, risks)	\$59	\$18	31.0%	\$77	3.9%	\$61	\$19	\$80	2029Q3	42.4%	\$87	\$27	\$114
0.2%	Contracting & Reprographics	\$29	\$9	31.0%	\$39	3.9%	\$31	\$9	\$40	2029Q3	42.4%	\$44	\$14	\$57
4.0%	Engineering During Construction	\$788	\$244	31.0%	\$1,029	3.9%	\$818	\$253	\$1,099	2032Q3	59.9%	\$1,305	\$405	\$1,710
1.0%	Planning During Construction	\$198	\$61	31.0%	\$257	3.9%	\$204	\$83	\$287	2032Q3	59.9%	\$326	\$101	\$427
4.0%	Adaptive Management & Monitoring	\$788	\$244	31.0%	\$1,029	3.9%	\$818	\$253	\$1,099	2032Q2	58.3%	\$1,292	\$401	\$1,693
0.3%	Project Operations	\$59	\$18	31.0%	\$77	3.9%	\$61	\$19	\$80	2029Q3	42.4%	\$87	\$27	\$114
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$1,571	\$487	31.0%	\$2,058	3.9%	\$1,632	\$508	\$2,138	2032Q3	59.9%	\$2,610	\$809	\$3,420
1.0%	Project Operation:	\$198	\$61	31.0%	\$257	3.9%	\$204	\$83	\$287	2032Q3	59.9%	\$326	\$101	\$427
1.0%	Project Management	\$198	\$61	31.0%	\$257	3.9%	\$204	\$83	\$287	2032Q3	59.9%	\$326	\$101	\$427
CONTRACT COST TOTALS:		\$30,914	\$10,142		\$41,056		\$31,788	\$10,421	\$42,187			\$44,490	\$14,461	\$58,951

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TPCS

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

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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report;

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: 15-Apr-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
	(WAF - Contract 8a)													
02	RELOCATIONS	\$0	\$0	31.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
03	RESERVOIRS	\$442,016	\$137,025	31.0%	\$579,041	2.5%	\$453,244	\$140,508	\$593,749	2040Q4	84.7%	\$836,919	\$259,445	\$1,096,364
09	CHANNELS & CANALS	\$119,959	\$37,187	31.0%	\$157,146	2.5%	\$123,008	\$38,132	\$161,137	2040Q1	80.5%	\$222,078	\$68,844	\$290,922
11	LEVEES & FLOODWALLS	\$0	\$0	31.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
13	PUMPING PLANT	\$89,100	\$21,421	31.0%	\$90,521	2.5%	\$70,855	\$21,985	\$92,820	2044Q2	104.7%	\$145,072	\$44,972	\$190,044
14	RECREATION FACILITIES	\$1,899	\$589	31.0%	\$2,488	2.5%	\$1,947	\$604	\$2,551	2045Q4	114.1%	\$4,188	\$1,292	\$5,460
15	FLOODWAY CONTROL & DIVERSION STRU	\$80,336	\$18,704	31.0%	\$79,040	2.5%	\$61,868	\$19,179	\$81,047	2038Q4	74.1%	\$107,682	\$33,382	\$141,064
19	BUILDINGS, GROUNDS & UTILITIES	\$3,764	\$1,167	31.0%	\$4,931	2.5%	\$3,860	\$1,197	\$5,056	2040Q3	83.3%	\$7,074	\$2,193	\$9,267
	CONSTRUCTION ESTIMATE TOTALS:	\$697,073	\$216,093	31.0%	\$913,166		\$714,780	\$221,582	\$936,361			\$1,322,993	\$410,128	\$1,733,121
01	LANDS AND DAMAGES	\$71,802	\$28,721	40.0%	\$100,522	2.5%	\$73,625	\$29,450	\$103,076	2025Q2	16.8%	\$85,987	\$34,387	\$120,354
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$3,485	\$1,080	31.0%	\$4,566	3.9%	\$3,620	\$1,122	\$4,743	2033Q3	66.3%	\$6,022	\$1,867	\$7,888
0.5%	Planning & Environmental Compliance	\$3,485	\$1,080	31.0%	\$4,566	3.9%	\$3,620	\$1,122	\$4,743	2033Q3	66.3%	\$6,022	\$1,867	\$7,888
4.0%	Engineering & Design	\$27,883	\$8,644	31.0%	\$36,527	3.9%	\$28,963	\$8,978	\$37,941	2033Q3	66.3%	\$48,174	\$14,934	\$63,107
1.0%	Reviews, ATRs, IEPs, VE	\$6,971	\$2,161	31.0%	\$9,132	3.9%	\$7,241	\$2,245	\$9,485	2033Q3	66.3%	\$12,043	\$3,733	\$15,777
0.3%	Life Cycle Updates (cost, schedule, risks)	\$2,091	\$648	31.0%	\$2,739	3.9%	\$2,172	\$673	\$2,846	2033Q3	66.3%	\$3,613	\$1,120	\$4,733
0.2%	Contracting & Reprographics	\$1,046	\$324	31.0%	\$1,370	3.9%	\$1,086	\$337	\$1,423	2033Q3	66.3%	\$1,807	\$560	\$2,367
4.0%	Engineering During Construction	\$27,883	\$8,644	31.0%	\$36,527	3.9%	\$28,963	\$8,978	\$37,941	2041Q1	125.0%	\$65,180	\$20,206	\$85,385
1.0%	Planning During Construction	\$6,971	\$2,161	31.0%	\$9,132	3.9%	\$7,241	\$2,245	\$9,485	2041Q1	125.0%	\$18,295	\$5,051	\$23,346
4.0%	Adaptive Management & Monitoring	\$27,883	\$8,644	31.0%	\$36,527	3.9%	\$28,963	\$8,978	\$37,941	2047Q2	191.0%	\$84,278	\$26,126	\$110,405
0.3%	Project Operations	\$2,091	\$648	31.0%	\$2,739	3.9%	\$2,172	\$673	\$2,846	2033Q3	66.3%	\$3,613	\$1,120	\$4,733
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$55,766	\$17,287	31.0%	73,053	3.9%	\$57,926	\$17,957	\$75,882	2041Q1	125.0%	\$130,359	\$40,411	\$170,770
1.0%	Project Operation:	\$6,971	\$2,161	31.0%	9,132	3.9%	\$7,241	\$2,245	\$9,485	2041Q1	125.0%	\$18,295	\$5,051	\$23,346
1.0%	Project Management	\$6,971	\$2,161	31.0%	9,132	3.9%	\$7,241	\$2,245	\$9,485	2041Q1	125.0%	\$18,295	\$5,051	\$23,346
	CONTRACT COST TOTALS:	\$948,371	\$300,457		1,248,829		\$974,853	\$308,831	\$1,283,684			\$1,818,955	\$571,613	\$2,390,568

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TPCS

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

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**** CONTRACT COST SUMMARY ****

PROJECT: Lake Okeechobee Watershed
LOCATION: Florida
This Estimate reflects the scope and schedule in report:

Lake Okeechobee Watershed PIR

DISTRICT: USACE-JACKSONVILLE DISTRICT
POC: CHIEF, COST ENGINEERING, Matthew Cunningham

PREPARED: 4/19/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 15-Apr-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19				FULLY FUNDED PROJECT ESTIMATE				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
13	(ASR Co-located with WAF - Contract 8b) PUMPING PLANT	\$88,013	\$27,284	31.0%	\$115,296	2.5%	\$60,248	\$27,977	\$118,225	2043Q3	100.3%	\$180,746	\$56,031	\$236,777
CONSTRUCTION ESTIMATE TOTALS:		\$88,013	\$27,284	31.0%	\$115,296		\$60,248	\$27,977	\$118,225			\$180,746	\$56,031	\$236,777
01	LANDS AND DAMAGES	\$186	\$74	40.0%	\$260	2.5%	\$191	\$76	\$267	2025Q2	10.8%	\$223	\$89	\$312
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$440	\$136	31.0%	\$576	3.9%	\$457	\$142	\$599	2039Q4	113.8%	\$977	\$303	\$1,280
0.5%	Planning & Environmental Compliance	\$440	\$136	31.0%	\$576	3.9%	\$457	\$142	\$599	2039Q4	113.8%	\$977	\$303	\$1,280
4.0%	Engineering & Design	\$3,521	\$1,091	31.0%	\$4,612	3.9%	\$3,657	\$1,134	\$4,790	2039Q4	113.8%	\$7,817	\$2,423	\$10,241
1.0%	Reviews, ATRs, IEPFRs, VE	\$880	\$273	31.0%	\$1,153	3.9%	\$914	\$283	\$1,198	2039Q4	113.8%	\$1,954	\$606	\$2,560
0.3%	Life Cycle Updates (cost, schedule, risks)	\$264	\$82	31.0%	\$346	3.9%	\$274	\$85	\$359	2039Q4	113.8%	\$588	\$182	\$768
0.2%	Contracting & Reprographics	\$132	\$41	31.0%	\$173	3.9%	\$137	\$43	\$180	2039Q4	113.8%	\$293	\$91	\$384
4.0%	Engineering During Construction	\$3,521	\$1,091	31.0%	\$4,612	3.9%	\$3,657	\$1,134	\$4,790	2043Q3	149.4%	\$9,121	\$2,828	\$11,949
1.0%	Planning During Construction	\$880	\$273	31.0%	\$1,153	3.9%	\$914	\$283	\$1,198	2043Q3	149.4%	\$2,280	\$707	\$2,987
4.0%	Adaptive Management & Monitoring	\$3,521	\$1,091	31.0%	\$4,612	3.9%	\$3,657	\$1,134	\$4,790	2048Q4	209.6%	\$11,321	\$3,509	\$14,830
0.3%	Project Operations	\$264	\$82	31.0%	\$346	3.9%	\$274	\$85	\$359	2039Q4	113.8%	\$588	\$182	\$768
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	\$7,041	\$2,183	31.0%	\$9,224	3.9%	\$7,314	\$2,287	\$9,581	2043Q3	149.4%	\$18,242	\$5,655	\$23,897
1.0%	Project Operation:	\$880	\$273	31.0%	\$1,153	3.9%	\$914	\$283	\$1,198	2043Q3	149.4%	\$2,280	\$707	\$2,987
1.0%	Project Management	\$880	\$273	31.0%	\$1,153	3.9%	\$914	\$283	\$1,198	2043Q3	149.4%	\$2,280	\$707	\$2,987
CONTRACT COST TOTALS:		\$110,862	\$34,384		\$145,245		\$113,980	\$35,351	\$149,330			\$239,685	\$74,323	\$314,008

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TPCS

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