

EXPLANATION OF CONSENT AGENDA ITEM E.2.c.(6) – January 18, 2017

ITEM:

Consideration of approving an increase to Purchase Order P14999 for CH2M in an amount not to exceed \$998,687 for additional engineering support services for the 21st Century Section 204 Harbor Deepening Feasibility Study Project. (Bob Musser/Jim Dubea)

EXPLANATION:

Background: The team of David Miller and Associates [DMA (project management)], Dial Cordy and Associates [DCA (environmental)] and CH2M (technical engineering) was competitively selected as Section 203/WRDA project continuing contractors by the Canaveral Port Authority Commission in March 2005. CH2M also holds the CPA Continuing Services Consultant for General Engineering Services through May 2019. After successfully leading Port Canaveral through the Harbor Deepening and Widening project, in February 2014 all three firms were approved for additional funding to start the 21st Century Project Deepening Feasibility Study to include project management, economic studies, environmental analysis, plan formulation and Section 204 reports and support. A project update was provided to the Commission by DMA in January 2016.

The 21st Century Project has undergone several changes since CH2M's original proposal included in the Engineering Appendix. The target depth at that time would have allowed for the reuse of most of the geotechnical data from the Section 203 44-Foot Channel Project. But as the feasibility study progressed, the project team was directed by previous CPA staff to evaluate increasing depths to accommodate larger cargo vessels, as presented in January 2016. A considerable amount of additional effort was expended developing the geometry and other features of the much deeper channel. However, in more recent discussions with CPA staff it was concluded that significantly increasing the channel depth would make USACE approval very difficult and by reducing the maximum target depth to a more realistic market-driven depth the project would likely still capture significant benefits while reducing the overall costs and would be much more acceptable by the USACE. The attached Technical Memorandum outlines task by task changes in the original scope and the impacts on the budget that have occurred due to the consideration of the deeper depths, the new maximum target depth and other features of the proposed project. It is anticipated that DMA and DCA can complete their assigned tasks under their existing budgeted amounts.

Scope of Work: This additional project scope of work is anticipated to be performed over 1-2 years, depending on the USACE reviews. The work includes time and materials tasks related to engineering analyses, including tasks such as surveying and mapping, existing structures suitability analysis, ship simulations, surge/hydrodynamic analysis, geotechnical analysis, dredged material management plan and modeling, assessment of inlet entrance and sediment trap additions/impacts, cost estimates and cost/schedule risk analysis, traffic impact analysis, and reporting and meetings as detailed in the attachment. Please note that additional funding will likely be needed to complete the final geotechnical sampling and testing of the selected project.

Funding Review by Finance (Pat Poston): The total amount of NTE amount of \$998,987 will exceed the budget for this item by \$320,687. However due to savings on the West Cargo Area Deepening-Project 2129, the amount of \$321,000 will be reallocated to this project. There will be no addition required to the FY17 Capital Budget. [Budget item 2128 - WTB Channel Entrance-21st Century Project]

Staff Recommends Approval

Prepared by Bob Musser

A handwritten signature in black ink, appearing to read "Bob Musser", with a long horizontal stroke extending to the right.



21st Century Channel Section 204 Engineering Appendix Budget Increase Request

PREPARED FOR: Robert Musser, Director of Environmental Plans & Programs, CPA
PREPARED BY: Mr. Gary Ledford, P.E.
COPIES: David Miller, DMA
DATE: October 25, 2016

Introduction

The 21st Century Channel Section 204 Feasibility Study has undergone several changes since CH2M's proposal for the Engineering Appendix that was approved in February, 2014. At that time the target depth for the Outer Reaches was expected to be no more than 55 feet, and that we could reuse most of the geotechnical data from the Section 203 44 Foot Channel Project. As the feasibility study progressed, the project team was directed by CPA staff to evaluate increasing the depth to 59 feet to accommodate larger cargo vessels. A considerable amount of effort was expended developing the geometry and other features of the much deeper channel. However, the project team came to the conclusion that increasing the channel depth by 13 feet would make USACE approval very difficult due to significant project costs and regulatory requirements for dredged material management, and that reducing the maximum target depth to the mid 50's could still capture significant benefits while reducing the dredge volumes by as much as 10 million cubic yards.

This Technical Memorandum outlines task by task changes in the original scope and the impacts on the present budget that have occurred due to the consideration of the 59 foot depth, the new maximum target depth and other features of the proposed project. Attached is a spreadsheet that tabulates the budgets for each task, the cost to date for each fiscal year, and the estimated increase projected for each task. Please note that these scope changes were discussed at the various project team meetings and that there was no objection to CH2M shifting budgets between tasks to temporarily fund the additional effort.

Task 1.0 Project Management Support

The original task budget was based on an approximate a two year schedule. The project is entering into year four. Project team meetings have increased due to the expanded scope and schedule, and it is anticipated that the USACE and Federal Agencies will require additional meetings as their involvement increases. In addition, during the first year of the project, meetings were held weekly rather than biweekly, which also contributed to increases to this task budget.

Net increase in task budget: \$77,438



Task 2.1 Surveying and Mapping

The survey and mapping budget was based on utilizing the as-builts from the 44 Foot Channel project and existing NOAA chart data. At the time when we began to develop the length and alignment of the channel extension, we found that because the continental shelf is so flat, determining the end of the extension for a particular project depth could have an uncertainty of as much as a quarter of a nautical mile. Consequently, CH2M contracted with ARC Survey and Mapping to survey the proposed channel extension to where the 55 foot depth would be encountered, approximately 5 nautical miles beyond the end of the existing channel, for a cost of \$18,135. When the 44 Foot Channel Project as-built surveys were completed, ARC then incorporated this new survey with the as-built surveys to form the baseline survey for the study. We are now using it to calculate quantities for the seven alternate plans.

Since we now intend to eliminate the jog in the channel near the north jetty, we need to investigate widening and deepening effects on the jetty. This will require additional survey and Geotech investigations. We have obtained a proposal from ARC to perform topographic and hydrographic surveys of the north jetty for a cost of \$15,000. CH2M will also have additional engineering effort with the new target depth and wider channel. It should be noted that during the consideration of the 59 foot channel, ARC performed a single line survey of two possible alignments of the additional extension to -59 feet at no cost to the project.

Net increase in task budget: \$48,401

Task 2.2 Existing Structures Suitability Analysis

As part of the deepening study, the effects of a deeper channel on the marine structures has to be determined. Since the port plans to demolish most of the older berths on the south side of the harbor, and the fact that the proposed channel position will avoid having to move the USAF shoreline (as outlined in Task 2.5), the structural engineering required for this task is less than originally anticipated.

Net reduction in task budget: (\$33,040)

Task 2.3 Ship Simulations

The determination of the design vessel has proved to be a more involved process with more interface with the economics side of the 21st Century Team. Consequently, CH2M added a task line item for CH2M and SDR Maritime & Analytics to research the design vessel characteristics and perform the hydrodynamic calculations to determine the draft of the vessel from the effects of squat, pitch and roll, and wave action. These calculations were completed for the design vessels for the 59 foot channel. The calculations have now been performed again for the three design vessels which support the present maximum target depth of 56 feet. This reduced the dredging from the 59 foot depth by approximately 10 million CY which will result in substantial cost savings to the project on the order of about \$100M.

This task also includes the estimated cost for performing the ship navigation simulations on the proposed channel at the STAR Center in Dania. It should be noted that the \$60,000 cost listed as an expense for this task was based on the 44 Foot Channel feasibility study which required three days at the facility. The matrix of ships and navigation scenarios selected for this study will



determine the actual number of days, and the final cost cannot be determined until the matrix is reviewed and approved by the USACE.

Net increase in task budget: \$48,344 (assuming that the budget for the STAR Center is adequate)

Task 2.4 Surge/Hydrodynamic Analysis

Coast & Harbor Engineering (CHE) is reusing the hydrodynamic model that they developed for the surge evaluation of the 44 Foot channel project. This model has also been used to perform several vessel surge studies for CH2M's Port Canaveral berth projects. Although the software and model CHE developed has been shown to provide results consistent with actual observations and past surge events, the USACE expressed concern about needing to validate the model with field tests when they were reviewing the 44 Foot project Section 203 study. With Project Team agreement, CH2M deployed two underwater lasers that collected data as ships transited the channel. The data has been compared to the results from the software and CHE has confirmed the accuracy of the model. This will eliminate any potential issues from the USACE during their future review of this project. The deployment and recovery of the instrumentation required the services of local commercial divers. The budget increase includes the cost of the dive subcontractor, the cost of renting the lasers for approximately 4 weeks, and the analysis of the data.

Net increase in task budget: \$78,945

Task 2.5 Geotechnical Analysis

Inner Harbor Geotechnical Work:

In the original proposal, the scope for Task 2.5 assumed that the geotechnical investigations from the Section 203 report would be sufficient and that the Inner Harbor geotechnical engineering effort would then only require desktop investigations by CH2M Geotechnical Engineers. The goal was to reuse as much existing information as possible, and that any issues associated with the proposed deeper channel depth along the USAF property could be mitigated by again moving the USAF shoreline north. However, the 44 Foot Channel Project experience has shown that relocating the USAF shoreline, spoil dike and riprap embankment was very challenging due the numerous and difficult to predict "no dig days." And, moving the shoreline will impact the USAF communication duct, require replacing or strengthening the bulkhead wall near the NOTU boat ramp, and the removal of the south end of the Poseidon Pier. Consequently, CH2M decided to investigate the alignment for the 21st Century Channel that would not require moving the USAF shoreline.

Design development cross sections through the proposed channel showed that it would be possible to continue the north side 3.5:1 channel side slope to depths of 53 and 54 feet, position a 500 foot wide channel at this new toe location, and still have enough room on the south side for the future berth box for the rebuild of CT3. The potential savings in channel construction cost would be on the order of \$10M. But this would only work if the deeper embankment had at least a factor of safety of 1.5 against slope stability failure. A preliminary analysis using the existing soils data showed that the proposed embankment had a factor of safety slightly below 1.5, which is not good practice and would not be accepted by USACE. An in-depth analysis using more refined soil properties was needed to show an adequate embankment factor of safety. Obtaining more refined soil properties required additional deeper borings with more frequent sampling.



To keep the project moving and because this was very critical to the alignment of the deeper channel within the harbor, the Project Team agreed with CH2M's decision to contract with Ardaman to perform the additional geotechnical investigations at a cost of \$344,610. This additional cost has been temporarily covered by shifting budgets from other tasks that either had yet to be started, or would not be completed for some time.

Ardaman has completed their investigation and with the new bore hole samples they have been able to show that the existing USAF shoreline and riprap embankment has a safety factor greater than 1.5. This is very good news, as the USAF shoreline, bulkhead wall, and other features can remain unaltered, reducing the new channel cost by about \$10 million. Plus, this avoids having to modify the USAF channel easement for the third time, which has proved to be a long, involved process.

The requested budget increase is the net effect of Ardaman's fee and reducing CH2M's budget, as some of the hours allocated for CH2M Geotechnical Engineers was not needed since Ardaman determined the geotechnical design parameters as part of their effort.

Net increase in task budget: \$301,769

North Jetty and Future Outer Harbor Geotechnical Work:

During the preparation of the original proposal, the extent and geometry of the Outer Harbor channel, and consequently the associated geotechnical effort, could not be fully defined. Now that the Project Team has selected the design vessels and performed the second set of navigation calculations, we have determined that the Outer Harbor channel will only need to be deepened, not widened as proposed for the 59 foot channel. Because the continental shelf is so flat, the Outer Reach will need to be extended by almost 5 nautical miles to reach the maximum target depth of 56 feet. Dredging to deepen the existing Outer Reach and the extension will be new work, and to accurately estimate the cost, we will need to know the characteristics of the material. In addition, the proposed channel alignment near the north jetty will need deeper borings for the stability analysis of the jetty. Unfortunately, there is very little to no geotechnical information in these new work areas, and the existing borings in the present Outer Reach are not deep enough to capture the proposed channel depths. And the outbound range tower borings, which could not be drilled from a floating barge, need to be completed.

Additional borings will be required, but bore hole drilling at and beyond the jetties cannot be performed from a floating barge and will require the mobilization and rental of a jack-up barge. Unfortunately, these can only be found in the Gulf supporting the offshore oil industry near Louisiana and Texas, or in the Carolinas in support of treasure hunting organizations. Consequently, the mobilization and rental alone has been priced by Ardaman to be \$395,640. Add to this cost the off-shore work insurance, the bore hole drilling, sampling, and laboratory work, the total for the north jetty, range towers and outer harbor geotechnical work for the 56 foot depth channel is estimated to be \$792,045.

As you are aware, we are investigating an alternate method to obtain the needed geotechnical information which could reduce this cost. Enhanced geophysical resistivity methods may significantly reduce the number of borings, which would not only reduce drilling, sampling and laboratory costs, but also reduce the jack-up barge rental time. At this time we recommend that



the North Jetty and Outer Harbor Geotechnical Work be postponed until we have fully evaluated the alternate method.

Task 2.6 Dredge Material Management Plan

The Dredge Material Management Plan (DMMP) is a requirement of the Section 203 and Section 204 process. The original budget was based on what was spent in the Section 203 for the 44 Foot channel project. The dredge spoil quantity for that project was estimated at slightly over 3 million CY, a volume within the limitations of the ODMDS site management plan (SMMP). But during that project mounding of disposed material in the ODMDS South Zone was reported twice. Now that the 56 foot channel is estimated to require as much as 11.1 million CY of dredging, the USACE and EPA will require assurance that the ODMDS can accommodate this project's material plus other projected future projects. Consequently, this task had to be expanded to include a capacity modeling study and detailed exploration of options to handle the projected spoil quantities.

As part of the modeling effort CH2M developed a listing and potential schedule for future dredging projects in the Port which included deepening or expansion of existing berths, turning basins, and new berths out to calendar year 2025. This has been updated and revised at least 12 times since it was developed, and it has been separated into two phases as outlined in the next paragraph. The dredge spoil from these future projects will add another 6 to 7 million CY to be disposed offshore.

The permitting and design of the WTB turning circle and NCB 5 & 6 deepening is underway under a separate project. As part of the permitting process, a capacity study of the ODMDS was performed by CH2M that captured the dredging projects up to and including the WTB cargo deepening project. The goal of this "Phase 1" capacity study was to demonstrate that the ODMDS could accommodate the WTB cargo deepening project under the present SMMP, in spite of the mounding that was reported during the 44 Foot project, thereby removing this issue as a hindrance to obtaining the permit. Phase 2 of the study is being performed as part of the DMMP effort in this task, picking up where Phase 1 left off, and adding in the proposed new channel and the various harbor projects that will occur after the WTB cargo deepening project.

In order to accurately set up the model for the capacity study, a baseline survey of the entire ODMDS was required. Surveys that were available were only for the south zone. After approval by CPA staff, CH2M tasked ARC to survey the ODMDS and an adjacent area equal to the ODMDS to the SE of the present ODMDS, as it was expected at that time that the ODMDS will need to be expanded. If it is deemed that expansion is needed, the survey of the adjacent area will allow Dial Cordy to start the cultural and environmental resource investigation that will be required to verify suitability for ODMDS expansion. The total cost for the bathymetric survey was \$20,000.

Based on the Phase 2 capacity study results, alternatives to increase the capacity will be explored, ranging from changes to the SMMP management protocols, to expanding the existing site, and/or establishing a new disposal site. In the event it is determined the ODMDS will require some form of expansion to support both the Section 204 DMMP and other inner harbor project dredging, the EPA would be the lead Federal agency responsible for the NEPA process which is not only outside of the Section 204 study scope of work, but is not permitted to be part of the Section 204.

Net increase in task budget: \$395,766 (Includes Phase 2 modeling, survey, and DMMP report)



Task 2.7 Inlet Entrance and Sediment Trap Impacts

The original budget included an investigation of impacts on the inlet entrance, sand bypass projects, and the south sediment trap. Dr. Kevin Bodge has recently recommended that this project include a study to determine if a sediment trap should be added to the north side of the channel. The sediment trap on the south side has proven to be very beneficial in reducing channel maintenance dredging, and adding a trap on the north side may further reduce maintenance dredging. The increase in budget is for Olsen & Associates to perform a study to determine if a north sediment trap would reduce maintenance dredging, and the effects on the stability of the north jetty due to aligning the north toe of the deeper channel closer to the jetty. The increase also includes the effort for CH2M to coordinate the Ocean Engineering stability analysis of the jetty in this task with the Geotechnical Engineering stability analysis performed in Task 2.5.

Net increase in task budget: \$42,500

Task 2.8 Cost Estimates and Cost/Schedule Risk Analysis

A line item task for a cost estimate at 65% level design using the USACE M3 software was added.

Net increase in task budget: \$29,340

Task 2.9 Traffic Impact Analysis

No change to date.

Task 3.0 Economic Studies

The effort to provide engineering data to support DMA's economic studies is less than originally anticipated.

Net decrease in task budget: (\$9,756)

Task 4.0 Environmental/NEPA Analysis

The effort to provide engineering data to support DMA's environmental studies is less than originally anticipated.

Net decrease in task budget: (\$6,000)

Task 5.0 Plan Formulation and Streamlined Feasibility Report

Budget was expended in investigating the geometry and dredge quantities for the 59 foot channel project. This cost needs to be recovered and used for the formulation of the seven alternate plans for the maximum 56 foot channel project.

Net increase in task budget: \$24,980



Task 6.0 Engineering and Design Analysis

This task and the effort associated with the Section 103 evaluation, final design, permits, preparation of bid documents, bidding, and construction administration services, have not been estimated. These will be estimated when the Recommended Plan is finalized, and after CPA staff has determined how the project will be divided into separate construction packages.

Summary of Requested Budget Increase for Tasks 1.0 thru 5.0 by Consultant:

	New Total	Original Budget	Increase
CH2M	\$ 1,544,835	\$ 1,061,358	\$ 483,477
ARC	\$ 53,155	\$ -	\$ 53,155
Ardaman	\$ 344,610	\$ -	\$ 344,610
SDR	\$ 37,500	\$ 20,000	\$ 17,500
Olsen	\$ 82,500	\$ 43,000	\$ 39,500
Anamar	\$ 40,000	\$ 40,000	\$ -
STAR Center	\$ 60,000	\$ 60,000	\$ -
Ghyabi	\$ 20,000	\$ 20,000	\$ -
CHE	\$ 258,945	\$ 198,500	\$ 60,445
Totals	\$ 2,441,545	\$ 1,442,858	\$ 998,687

Total Increase: \$998,687

Original Budget: \$1,442,858

Total Estimated Budget: \$2,441,545

Section 204 Tasks

DPA-WO 2014-11 (P) 4888
CH2M

G Lafford
10/25/2016



Engineering Appendix

Major Task Breakdown per 2014 Project Management Plan
Phase 2 Output Response

Spent to Date
% Complete

Task #	Task Description	Subcontractor	Project Director	Senior PM	PM	PM	Staff PM	Staff Support	Expenses Sub-Consultants	Travel	Total Budget	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	Spent to Date % Complete	Original Budget Feb 2014	Increase or Decrease	
1.0	Project Management Support Schedules, USACE & Consultant coordination Project Team meetings USACE & Federal Agencies meetings Weekly Coordination Expenses and Total for Task			40	24	24	24	40			\$21,300	\$2,514	\$4,000	\$2,349	\$3,866	\$6,229	88%	\$20,544	\$77,438	
2.1	Surveying & Mapping Set up base maps from Section 200 As Batts survey to 55 foot depth Recursive engineers survey Design multiple quarters for incremental widths & depths Review base figures Expenses and Total for Task	ARC/Burley		4		8	80		181.12		\$20,151	\$20,451		\$1,141	\$8,155	\$74,026		\$21,188	\$48,816	
2.2	Existing Structure Suitability Analysis Identify and inventory boating structures Research history and compile structural details Perform structural analysis Soil study report Develop mitigation plan Coordinate future use with Master Plan Expenses and Total for Task			8		40					\$6,260		\$3,034	\$720	\$4,500		53%	\$8,116	\$23,046	
2.3	Ship Simulations Coordinate with STAR Center, Piers, USACE, USCG Develop 3D model of pier Simulation matrix Alphabet simulation exercises - 3 days Review STAR Center report Review models of pier alternatives Summary report Establish preliminary channel design geometry Establish preliminary plan for pier construction Expenses and Total for Task	STAR Center		8	24	8	0	16	36,000	150	\$7,008		\$20,638	\$6,300	\$7,000		92%	\$13,811	\$48,344	
2.4	Barge Hydrodynamic Analysis Perform surge hydrodynamic analysis of pier alternatives Identify surge causes and mitigation measures Perform harbor flooding analysis Modify pier profiles to mitigate mooring stresses Expenses and Total for Task	CH2M		8	40	40	8	16	196,500		\$218,076	\$7,818	\$28,064	\$11,750	\$58,204		80%	\$27,106	\$78,843	
2.5	Geotechnical Analysis Review previous geotechnical investigation and data Determine design sediment quality for off shore disposal Investigate the stability of boating mooring structures Perform geotechnical investigation and report Determine ranges for geotechnical investigation and report Determine ranges geotechnical investigation and report Summary Geotech report Expenses and Total for Task	Hydraman		8	16	24	24	16	8,440		\$12,324	\$5,844	\$1,516		\$7,329	\$6		\$21,552	\$30,174	
2.6	Designated Material Management Plan ANMAAN Risk Map Investigation of potential status Review ERDC report, coordinate with results from Phase 1 OUMMS model Project quantity estimates for off shore disposal Project quantity estimates for on shore disposal Determine OUMMS capacity Determine permit capacity OUMMS annual Initial amount OUMMS replacement OUMMS new site Expenses for new permit and Offshore, vessel disposal site cost estimate Perform a beneficial use alternatives study Project material management plan Expenses and Total for Task	ARC/Burley		12	26	8	24	40	40,000		\$45,741	\$12,724	\$1,758	\$148	\$6	\$45,740			\$81,764	
2.7	Inter Entrance and Berthing Trap Impacts Investigate impacts on piers Investigate impacts on Berthing Trap Perform analysis of impacts on salt and pass projects Perform wave study of the inlet and harbor Expenses and Total for Task	Chen		4		4	8		9,000		\$11,514			\$5,000	\$6,514			\$8,274	\$42,500	
2.8	Cost Estimate and Cost/Schedule Risk Analysis Prepare cost estimate using USACE MS software Perform cost and schedule risk analysis Cost risk analysis for 65% design Expenses and Total for Task			40	88	40	40				\$33,706				\$25,146	\$23,700		\$80,004	\$26,143	
2.9	Traffic Impact Analysis Investigate existing roadways and bridges Assess future traffic Expenses and Total for Task	Chen		4	40	40	16	8	20,000		\$16,300				\$16,300			\$38,278	\$3	
3.0	Economic Studies Provide engineering data to support DMA's economic studies			16		16	16	8			\$8,744			\$8,744			3%	\$18,536	\$8,735	
4.0	Environmental/NEPA Analysis Provide engineering data to support DMA's environmental studies			16		40	16	8			\$12,380			\$12,380			3%	\$18,536	\$8,500	
5.0	Plan Formulation and Streamlined Feasibility Report Lead project team with Plan formulation Screening of alternatives Final report Provide the Engineering Appendix Assist with revision of USACE and other agency review comments Lead project team with 60% and 65% design with USACE Expenses and Total for Task			60	40	80	40	40			\$49,950	\$10,200	\$10,000	\$20,000	\$8,666			\$139,776	\$24,980	
6.0	Engineering and Design Analysis Preliminary concept level questions and design Establish plan for Auto to navigation Design of low-voltage protected plan 65% Design for 2014/408 Region Final Design Phase & Specifications Procure the Services Expenses and Total for Task			40	40	80	40	40			\$18,754	\$9,881	\$18,000	\$30,000	\$18,169		4%	\$139,776	\$24,980	
	Permitting (102, 404, 10, State WO and CEM Certification) Provide Environmental Resource Form Application Agency Review for Approval/Completeness and Public Notice Response to Top Requests for Additional Information Expenses and Total for Task			40	40	40	40	40			\$0	\$0	\$0	\$0	\$0			\$0	\$0	
TOTALS				1782	1780	1024	2608	1138	418	\$993,510	\$3,472	\$2,441,848	\$118,523	\$418,261	\$681,317	\$830,701	\$812,601	\$1,058,387	\$1,443,838	\$98,087
	Original Budget										\$118,818	\$1,323,448	\$8	\$8	\$8			\$1,443,838	\$98,087	
	Actual Spent thru 9/30/2016										\$116,629	\$489,620	\$460,769					\$1,050,927		

8888 Estimated additional cost for 56 face channel spurs based on known facts as of October 21, 2016.

5555 Estimated design tasks and costs to be determined based on known

Item	New Price	Quantity	Budget	Increase	Completion
CH2M	\$144,535	1,007,328	\$144,535	\$0	100%
ARC	\$3,155	8	\$3,155	\$0	100%
Hydraman	\$44,610	344,610	\$44,610	\$0	100%
STAR	\$7,500	30,000	\$7,500	\$0	100%
Chen	\$8,500	43,500	\$8,500	\$0	100%
Anam	\$40,000	40,000	\$40,000	\$0	100%
STAR Center	\$60,000	60,000	\$60,000	\$0	100%
Global	\$9,000	90,000	\$9,000	\$0	100%
CH2M	\$28,361	188,500	\$28,361	\$0	100%
Totals	\$241,542	1,442,838	\$241,542	\$0	100%