BOARD OF SUPERVISORS AGENDAITEM SUMMARY

Requested Board Meeting Date: October 15, 2013

ITEM SUMMARY, JUSTIFICATION and/or SPECIAL CONSIDERATIONS

Amendment #11 contract #CT-WW-08050412-P, CH2M Hill, Inc. to provide Design Engineering Services for the Ina Road WPCF Capacity and Effluent Quality Upgrade Proje ct. This amendment increases funding for engineering services during construction to provide funding through project construction completion. Funding source: RWRD Obligations. Administering Department: Regional Wastewater Reclamation Department.

Effective Date:	October 15, 2013
Termination Date:	December 4, 2014
Original Contract Amount:	$18,000,000.00
Previous Amendment(s):	$9,313,903.00
Previous Contract Amount:	$27,313,903.00
This Amount this Amendment:	$2,656,436.88
Revised Contract Amount:	$29,970,339.88

Cont # : CT-WW-08050412-P-11
Effective: 10-15-2013
Term : 12-04-2014
Cost : $2,656,436.88
Rev :
Tot : $2,656,436.88
NTE : $29,970,339.88
Timex : 120
Renewal : 09-01-2014
Term : 12-04-2014

Project Manager:	Jaime Rivera
Contract Officer:	Jerome Rizzo, 740-3245 Procurement Department

Vendor is using a Social Security Number: No

AMS CT# CT-WW-08050412-P

Please return to Harry Lewis.

CLERK OF BOARD USE ONLY: BOS MTG. _____

ITEM NO. _____

To: COB- 10.2.13
Agenda 10.15.13
(1)

Procure Dept 09/30/13 PM08:21

PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT

PROJECT: **DESIGN ENGINEERING SERVICES FOR THE INA ROAD WPCF CAPACITY AND EFFLUENT QUALITY UPGRADE**

CONSULTANT: **CH2M HILL, Inc.**
2625 South Plaza Drive, Suite 300
Tempe, AZ 85282

CONTRACT NO.: CT-WW-08050412-P

AMENDMENT NO.: Eleven**(11)**
FUNDING: **RWRD Obligations**

CONTRACT
NO. CT-WW-08050412 - P
AMENDMENT NO. 11
This number must appear on all invoices, correspondence and documents pertaining to this contract.

CONTRACT TERM: 02/05/08 - 02/04/10	**ORIGINAL CONTRACT AMOUNT:**	$ 18,000,000.00
TERMINATION PRIOR AMENDMENT: 02/04/14	**PRIOR AMENDMENT(S):**	$ 9,313,903.00
TERMINATION THIS AMENDMENT: 12/04/14	**AMOUNT THIS AMENDMENT:**	$ 2,656,436.88
	REVISED CONTRACT AMOUNT:	$ 29,970,339.88

CONTRACT AMENDMENT

WHEREAS, COUNTY and CONSULTANT have entered into the above referenced contract for professional engineering design services for the Ina Road WPCF Capacity and Effluent Quality Upgrade project (Project); and

WHEREAS, under contract Amendment No.8 the scope of the engineering services during construction was identified and added to the contract services; and

WHEREAS, at the time of Amendment No. 8 an initial allowance for engineering services during construction was in existence; and

WHEREAS, this initial allowance was less than the estimated amount for these services; and

WHEREAS, under contract Amendment No. 10 funding for Engineering Services During Construction was increased however at the time the scope of services required during construction was not fully defined; and

WHEREAS, the construction of the project has now advanced to the point where the final scope of engineering services during construction is now defined; and

WHEREAS, the parties have agreed on the final cost for engineering services during construction; and

WHEREAS, the parties now agree to increase the funding for completion of engineering services during construction; and

WHEREAS, under contract Amendment No. 10, APPENDIX "B" contained a calculation error resulting in an under-calculation of the total contract amount by $9,821.88; and

WHEREAS, this under-calculation is corrected by this Amendment No. 11.

NOW, THEREFORE, it is agreed as follows:

CHANGE: ARTICLE IV – PAYMENT, third paragraph,

From: "The total of all payments to DP for services provided under this Contract shall not exceed Twenty Seven Million Three Hundred Thirteen Thousand Nine Hundred Three Dollars ($27,313,903.00) unless otherwise agreed to by OWNER."

To: "The total of all payments to DP for services provided under this Contract shall not exceed Twenty Nine Million Nine Hundred Seventy Thousand Three Hundred Thirty Nine Dollars and Eighty Eight Cents ($29,970,339.88) unless otherwise agreed to by OWNER."

REPLACE: in EXHIBIT "A" – SCOPE OF WORK, that portion of EXHIBIT "A" titled "Services During Construction" dated Revised October 24, 2011 (including Attachment 1 Fee Proposal (13 pages total) with "Services During Construction" Revised July 8, 2013 (including Attachment 1 Fee Proposal – September 18, 2013) (14 pages total).

REPLACE: APPENDIX "B" REVISION 11/15/11 COMPENSATION SCHEDULE – COST PLUS FIXED FEE, NOT TO EXCEED, with APPENDIX "B" REVISION 9/18/2013 COMPENSATION SCHEDULE – COST PLUS FIXED FEE, NOT TO EXCEED (4 pages attached).

This Amendment shall be effective on October 15, 2013.

All other provisions of the Contract, not specifically changed by this amendment, shall remain in effect and be binding upon the parties.

IN WITNESS WHEREOF, the parties have affixed their signatures to this amendment on the dates written below.

PIMA COUNTY:

_____
Chair, Board of Supervisors

_____
Date

ATTEST:

_____
Clerk of the Board

_____
Date

APPROVED AS TO FORM:

_____
Deputy County Attorney
CHARLES WESSELHOFT

_____
Printed Name

9-19-13
Date

CONSULTANT:

Ronald E. Williams
Signature

Ronald E. Williams - Vice President
Name and Title (Please Print)

9/26/2013
Date

Pima County Regional Wastewater Reclamation Department

Ina Road WRF Capacity and Effluent Quality Upgrade Project
Services During Construction
Revised July 8, 2013

Introduction

This is the final amendment to CH2M HILL's contract for the Ina Road Wastewater Reclamation Facility Capacity and Effluent Quality Upgrade project. This scope of work reflects the work remaining to be completed on the project and the effort required to complete this project. Other change orders have provided a scope of work for other elements of the project. At this time, this scope and effort only covers the work required to the end of the contract.

The Design Professional (DP) agrees to furnish the following construction phase services for the Ina Road Wastewater Reclamation Facility (WRF) Capacity and Effluent Quality Upgrade Project (the Project). The DP shall commence work upon receipt of Notice to Proceed for this phase of services from the Pima County Regional Wastewater Reclamation Department (PCRWRD). The services to be provided during the construction phase are intended to assist the PCRWRD in administering the Construction Manager At Risk (CMAR) Contract for construction, providing engineering services during construction (SDC), verifying that the CMAR's work is in substantial compliance with the Contract Documents design intent, and assisting the PCRWRD in responding to events that occur during the construction. The following key assumptions were made in the compilation of this Scope of Work and in estimating level of effort:

- The Project will be constructed under different CMAR Guaranteed Maximum Price (GMP) contracts for construction. The SDC services for the following GMPs are included in this scope of work.
    - GMP 6 - Plant Upgrade
    - GMP 7 - Plant Improvements
    - GMP 8 - Electrical Upgrade
    - Ina Road WRF - Ammonia Feed Facilities
- It is noted that at the time of development of this scope of work that GMP 2/3 - Gravity Belt Thickener and GMP 5 - Digester Complex are complete.
- The OWNER is currently undecided regarding implementation of the Ammonia Feed facilities for THM control. Effort has been included assuming the OWNER decides to proceed forward.
- The DP's services are based upon a construction duration of 44 months (July 2010 to February 2014) for the main Upgrade project and March 2014 for GMP 7 - Plant

- The DP will be promptly notified of any development that affects the scope or timing of the DP's services, or of any defect in the work of DP or the CMAR.
- Any labor and expenses required to address non-DP design based construction claims, unforeseen subsurface considerations or additional construction requested by the CMAR or the PCRWRD will constitute additional services.
- Any claims resolution or litigation assistance requested of the DP by the PCRWRD will constitute additional services.
- The DP will coordinate its design with the PCRWRD SCADA Integrator and review the SCADA Integrator's product for compatibility and interpretation of the DP's control strategy and loop diagrams.
- J2 Engineering and McCarthy Architecture will provide assistance with review of submittals and RFIs.

Health and Safety

DP will manage the health, safety and environmental activities of its staff and the staff of its sub-DPs to achieve compliance with applicable health and safety laws and regulations.

DP will coordinate its health, safety and environmental program with the responsibilities for health, safety and environmental compliance specified in the Contract for Construction between PCRWRD and the CMAR. DP will coordinate with responsible parties to correct conditions when observed that do not meet applicable federal, state and local occupational safety and health laws and regulations, when such conditions expose DP staff or sub-DP staff to unsafe conditions.

DP will notify affected personnel of any site conditions posing an imminent danger to its staff which DP observes.

DP is not responsible for health or safety precautions of CMAR or its employees. DP is not responsible for the Contractor's compliance with the health and safety requirements in the contract for construction, or with federal, state, and local occupational safety and health laws and regulations.

Task 1 Project Management

The DP will provide Project Management for SDC as defined below:

Task 1.01 – Project Administration

The DP will provide a construction phase services Project Execution Plan to include work planning, staff scheduling, budget control, records management, communication protocols and related functions for management of the DP 's Project Team for the 44 month construction period. The DP will prepare monthly invoices and provide required information for the PM/CI's Project Monthly Status Report.

Task 1.02 – Communications

The DP will provide routine communications with the PM/CI. Formal communications will be documented and the PM/CI will be provided a copy of the communication documentation. The DP will attend the weekly construction progress meetings during the 44 month construction period and estimated six (6) public relations/regulatory meetings.

Task 1.03 – Coordination

The DP will mobilize a team on-site for the duration of the construction to provide site coordination between the DP, CMAR, PM/CI and PCRWRD. As requested by the PM/CI, the DP will coordinate periodic site-visits by members of the design team to review construction progress and general quality of the work and evaluate construction relative to compliance with the design intent. The DP will coordinate the activities of its sub-DP.

Tasks 6, 7, 8, and Ammonia Feed Facilities - Submittal Review, Requests for Information (RFIs), Clarifications, and Modifications

The following sections apply to the Capacity and Effluent Quality Upgrade Project.

Submittal Review

The DP will review the CMAR's shop drawings, samples, and other submittals for general conformance with the design intent and the requirements of the Contract Documents. Such review shall not relieve the CMAR from its responsibility for performance in accordance with the contract for construction, nor is such review a guarantee that the work covered by the shop drawings, samples and submittals is free of errors, inconsistencies or omissions. The DP's services are based on an estimated number of submittals shown in the table below by GMP, with a review time of 5.7 hours per submittal. The DP's submittal review efforts will include a maximum resubmission rate of 50 percent, with a review time of 2.9 hours per resubmittal.

BASIS OF EFFORT

GMP	Drawing Count	Number of Submittals	Number of Resubmittals
GMP 2/3 – GBT	42	53	26
GMP 5 – IBS - Digester Complex	151	189	94
GMP 6 – Plant Upgrade	1,311	2,491	1,246
GMP 7 – Plant Improvements	311	591	296
GMP 8 – Electrical Upgrade	116	220	110

Should additional reviews be required, the DP shall track these costs in order to be entitled to additional compensation consistent with the provisions of the Contract Documents. The DP will utilize Adobe Acrobat, Version 7.0, and electronic signatures for processing Web based submittals. All submittals are to be in electronic format only.

RFIs and Clarifications

The DP will review and respond to the CMAR's requests for information (RFIs) and/or contract clarification information requests (CCIRs). The DP's services are based on an estimated number of RFIs shown in the table below by GMP, with a review time of 3.9 hours per RFI.

BASIS OF EFFORT

GMP	Number of Drawings	Number of RFIs
GMP 2/3 – GBT	42	59
GMP 5 – IBS - Digester Complex	151	211
GMP 6 – Plant Upgrade	1,311	1,836
GMP 7 – Plant Improvements	311	435
GMP 8 – Electrical Upgrade	116	162

Should additional reviews be required, the DP shall track these costs in order to be entitled to additional compensation consistent with the provisions of the Contract Documents. The DP will coordinate such reviews with the design team and with the PM/CI as appropriate. The DP will coordinate and issue responses to the requests.

Modifications

The DP will assist the PM/CI and PCRWRD in reviewing and responding to any CMAR request for substitution of materials and equipment. DP will review such requests and will advise the PM/CI and PCRWRD as to the acceptability of such substitutions.

The DP will assist PCRWRD in review and issuance of PCRWRD initiated changes. Design and engineering services to prepare drawings, specifications and other information for the change shall be considered as a Supplemental Service, and shall entitle the DP to additional compensation.

The DP will assist the PM/CI and PCRWRD in reviewing CMAR initiated changes to the Construction Contract. The DP will make recommendations to the PM/CI and PCRWRD regarding the acceptability of the CMAR's request and assist PCRWRD, in negotiating the requested change. Upon agreement and approval, the DP will assist the PM/CI in preparing documentation for the change order. The preparation of CMAR initiated change order drawings and specifications for issuance to the CMAR shall be considered a Supplemental Service, entitling the DP to additional compensation. PCRWRD will prepare all actual change orders to the Construction Contract.

Document Tracking

The DP will receive, distribute, track and return shop drawings, other submittals and documents from the PM/CI . Submissions of RFIs, CCIRs or other correspondence by the CMAR to the DP or by the CMAR through the PM/CI shall be acted on and returned to the CMAR within seven (7) working days of receipt by the DP. Shop drawing submittals shall be acted upon and returned to the CMAR within fourteen (14) days of receipt by the DP for single-discipline submittals and twenty-one (21) days of receipt by the DP for multi-discipline submittals.

Submittal review, RFIs and clarifications, modifications and document tracking will be delineated in Tasks 2, 5, 6, 7 and 8 for GMPs 2/3, 5, 6, 7 and 8 as follows:

Task 2 – Gravity Belt Thickener (GMPs 2 and 3) - Complete

Task 3 – Not Used

Task 4 – Not Used

Task 5 – Interim Biosolids – Digester Complex (GMP 5) - Complete

Task 6 – Capacity and Effluent Quality Upgrade (GMP 6)

Task 6.01 - Submittal Review

Task 6.02 - RFIs and Clarifications

Task 6.03 - Modifications

Task 6.04 - Document Tracking

Task 7 – Plant Improvements (GMP 7)

Task 7.01 - Submittal Review

Task 7.02 - RFIs and Clarifications

Task 7.03 - Modifications

Task 7.04 - Document Tracking

Task 8 – Electrical Upgrade (GMP 8)

Task 8.01 - Submittal Review

Task 8.02 - RFIs and Clarifications

Task 8.03 - Modifications

Task 8.04 - Document Tracking

Ammonia Feed Facilities

Task AA.01 - Submittal Review

Task AA.02 - RFIs and Clarifications

Task AA.03 - Modifications

Task AA.04 - Document Tracking

Task 9 – Not Used

Task 10 – On-Site DP Services

Task 10.01 - Owner Requested Site Visits

The DP will provide PM/CI requested members of the design team to make periodic site visits covering work such as electrical, mechanical equipment placement, structures, architectural, HVAC, I&C, site civil and other technical disciplines as may be requested by PM/CI related to key design issues.

The DP will witness the factory testing of major mechanical, electrical, and I&C equipment. Specifically for the I&C, the DP will participate in the factory test, operational readiness test, and performance acceptance testing. For each site visit, the DP will prepare a site visit report that documents the purpose of the site visit, the outcome and results of the site visit and ultimately a recommendation as to the pass/failure of the system/equipment based on the criteria outlined during the site visit.

The DP will participate in the company of the PM/CI and CMAR in a site visit for the purposes of determining Substantial Completion of the Project in accordance with the Contract Documents. When ready, the CMAR will request the substantial completion site visit. The PM/CI will prepare a list of items to be completed or corrected. The DP will

review the list for concurrence. This will also include the instrumentation and control system start-up punch lists based on observations during on-site testing. It is a requirement that the DP agree that the Project has reached substantial completion status before the DP's process guarantee is valid.

For estimating purposes, the assumptions in the following table were used to estimate hours for site visits, factory tests, factory acceptance tests and substantial completion visits.

BASIS OF EFFORT

Activity	Staff	Duration	Visits	Hr / Visit
Site Visits / Factory Tests				
GMPs 2/3, 5, 6	4	36 months	1 x month	12 hours
GMP 7	3	6 months	1 x month	12 hours
GMP 8	3	6 months	1 x month	12 hours
Factory Acceptance Tests				
GMP 2/3	1	5 days	1	40 hours
GMP 5	1	5 days	1	40 hours
GMP 6	1	5 days	3	40 hours
GMP 6	1	10 days	3	80 hours
GMP 8	1	5 days	1	40 hours
Substantial Completion Visits				
GMP 2/3	3	-	1	12 hours
GMP 5	3	-	1	12 hours
GMP 6	3	-	7	12 hours
GMP 7	3	-	2	12 hours
GMP 8	3	-	1	12 hours

Additional factory tests or site visits, as requested by the PM/CI, will be performed as Supplemental Services, entitling the DP to additional compensation.

Task 10.02 – Resident Engineer

The DP will provide an on-site resident engineer to facilitate CMAR submittal and RFI coordination with the DP's design center as well as other communications between the DP and CMAR, PM/CI and PCRWRD.

The DP resident engineer will attend weekly construction progress meetings with the PM/CI, CMAR, and PCRWRD. The DP will also attend "other meetings" as may be required to review particular issues. The basis for this "other meeting" effort is 2 meetings per month, 6 hours per meeting for 36 months with two DP staff members in attendance.

Task 11 Closeout Phase Services

DP will assist the PCRWRD in closing out the Contract for Construction and commencement of the PCRWRD's use of the completed Work. The DP's services will include the following.

Task 11.01 – Startup Services

The DP will assist the CMAR and PCRWRD in the startup of the new facilities, while the PCRWRD Operations Staff will operate the new facilities during startup. The services under this task will include review and preparation of start-up procedures, assistance in trouble shooting, and fine-tuning operation. The PCRWRD Operations Staff will operate the new facilities during startup. It is possible that startup will occur at the individual process unit level and not at the facility level. For estimating purposes, it is assumed that there will be nine (9) different facilities/processes that will be started up, as delineated by the following facilities/processes:

1. Interim Biosolids – Gravity Belt Thickener (1 unit)
2. Interim Biosolids – Digester Complex
3. Headworks
4. Bardenpho Liquid Stream – New East Plant
5. Bardenpho Liquid Stream – New West Plant
6. Bardenpho Liquid Stream – Modified BNRAS Facility
7. Centrifuges – Digested Sludge Storage and Dewatering
8. Gravity Belt Thickener (2 units) – WAS Storage and Thickening
9. Odor Control

It is anticipated that the CMAR will develop and distribute the startup schedule several months ahead of the anticipated time for startup. The DP will closely coordinate this activity with the CMAR.

Task 11.02 – Training

The DP will provide supplemental instruction to PCRWRD's staff in the operation, maintenance, and testing of the equipment provided under this Project. This instruction shall cover both the basic operational concept and actual operation of the systems and components under both normal and abnormal operations that are likely to occur. The DP will prepare a training syllabus and training materials to leave with the PCRWRD staff. Training materials will be delivered to PCRWRD as an electronic copy and in one (1) hard copy format.

For estimating purposes, it is assumed that there will be nine (9) different facilities/processes that will be started up thus requiring up to nine (9) training sessions, as delineated by the following facilities/processes:

1. Interim Biosolids – Gravity Belt Thickener (1 unit)
2. Interim Biosolids – Digester Complex
3. Headworks
4. Bardenpho Liquid Stream – New East Plant

5. Bardenpho Liquid Stream - New West Plant
6. Bardenpho Liquid Stream - Modified BNRAS Facility
7. Centrifuges
8. Gravity Belt Thickener (2 units)
9. Odor Control

One training session will be provided for each of the nine (9) different facility groups. If multiple sessions are required, this shall be considered a Supplemental Service, entitling the DP to additional compensation. Each training session will be videotaped by Others.

Task 11.03 – Operations and Maintenance Manual

The DP will develop a web-based Process Operations and Maintenance (O&M) manual describing the operation of the individual unit processes at the Ina Road WRF. It is anticipated that the manual will be comprehensive and complete and similar to other manuals prepared for a facility with both liquids and solids treatment of similar size to the Ina Road WRF. PCRWRD has requested that the Process Operations and Maintenance Manual include existing facilities as well.

The O&M manual will generally explain the various primary modes of operation that may be used, including normal operation, peak flow conditions, and emergency operation procedures. The manual will explain the purpose and basic concept of the various processes that are incorporated into the overall plant. Where appropriate, reference will be made to the manufacturer's detailed O&M submittals. The manual will be suitable for use as an operational tool and to facilitate operator training. The manual will be produced in an electronic format that is consistent with the PCRWRD's most recent guide. Sections of the O&M currently identified include:

1. Preliminary Treatment
2. Intermediate Pumping
3. Primary Treatment
4. Primary Sludge Thickening
5. Bioreactors
6. Secondary Clarifiers
7. WAS Thickening and Storage
8. Anaerobic Digestion
9. Digested Sludge Thickening/Dewatering/Storage
10. Biosolids Storage and Loadout
11. Instrumentation and Control (SCADA)
12. Chemical Storage and Feed Systems
13. Odor Control System
14. Disinfection
15. Support Systems (i.e. HVAC, electrical, plant air, service water, etc.)

Other components of the web-based O&M will include links to drawings and photos. The DP will create the web-based infrastructure, including graphical interfaces (using graphics

produced by others) and navigation links. Screens used for the web-based interface will be produced by others (not DP).

Pima County IT Department will provide the server where the O&M Manual will reside. CH2M HILL will provide 6 hard copies of the draft O&M Manual, and 6 hard copies of the Final O&M Manual will be provided to PCRWRD. The server hardware shall conform to the PCRWRD Information Technology (IT) Standards.

Task 11.04 – Final Completion

The DP will participate in a final completion site visit along with the PM/CI, CMAR, and other PCRWRD staff as appropriate for the purposes of determining that the completed Project has met the requirements of the Contract Documents regarding Final Completion. The DP will assist the PM/CI in preparing a list of particulars in which this site visit reveals that the Work is incomplete or defective and will make recommendations to PCRWRD concerning acceptance when items on the final punch list have been completed or corrected.

Task 11.05 – Closeout File and Records

The DP will provide the PCRWRD with an organized indexed set of Project documents and records. The organization and indexing of the documents and records shall be prior approved by PCRWRD.

Task 11.06 – Closeout Workshop

The DP shall participate in a closeout workshop. The PM/CI will lead the meeting, prepare the required materials, and prepare and distribute meeting minutes.

Task 11.07 – Record Drawings

The DP will revise the original design drawings to reflect record information provided by the CMAR, PM/CI and equipment suppliers. The DP's services are based on an estimated 4 hours per drawing. One electronic file in the most current version of AutoCAD, one PDF file, and two hard copies (one full-size set and one half-size set) will be provided to PCRWRD. PCRWRD has also requested one overall site plan reflecting the entire site whereby one file for the underground piping would reside.

Task 12 – Post Construction Phase Service

Task 12.01 - On-Call Operational Assistance

The DP will provide on-call operational assistance if requested. An allowance has been included for that task. CH2M HILL will respond to requests by the Owner.

Task 12.02 - Final Arc Flash Evaluation

A field investigation will be performed to obtain data on the overcurrent protective devices (manufacturer's data and settings) for the equipment that will remain in service after completion of the Upgrade Project.

The final arc flash study will be conducted using SKM's software, Power Tools for Windows (PTW). The software conforms to arc flash calculation requirements of IEEE 1584 and NFPA 70E.

The final arrangement of the plant distribution system will be used to calculate arc flash potentials. This includes the "normal" and "alternate" supply from Tucson Electric Power (TEP) (West Ina Circuit Nos. WI-13 and WI-42). TEP has provided the characteristics of their feeders. It is assumed that the 5kV switchgear at Facility 14 will be removed from the system.

The following description outlines the effort that is required to provide a complete arc flash evaluation.

Data Collection and Verification

Per Section 26 05 70, Contractor was to develop electrical system analysis models using SKM System Analysis Power*Tools. Once the model was complete, the Contractor was to provide copies of the electrical system model(s). The plan was to use the model to support the arc flash evaluation. A summary report has been submitted by the Contractor, but the system model was not provided. Based on the data provided, additional information is required to be collected and/or verified for the overcurrent protective devices as well as all aspects of the power system including, but not limited to:

- Cable size
- Feeder length
- Location and identification of all devices that are to be labeled
- Motor nameplate data
- Transformer nameplate data

In order to develop a system model for all of the Ina Road WRF facilities, it is necessary for CH2M HILL to gather information from a wide range of sources including but not limited to original plant drawings so that a complete model can be developed that will include all of the existing facilities. Information for new equipment was gathered from shop drawings, O&M manuals and design change notices. For example, the model used to prepare the labels for the East Plant contains more than 3,900 individual elements.

Upgrade and Expansion of Project Scope

Since Change Order 11 was executed in August 2011, changes to the overall project plan have added to the number of arc flash labels that will be needed before the work is complete. These changes have included:

- Change Order 17 - Site Security (October 2011)
- Change Order 18 - 46kV Substation (August 2011)
- Change Order 19 - Existing Process Improvements (November 2011)
- Change Order 20 - Thermal Energy Facility (May 2012)

Printing and Application of Labels

To complete this work, CH2M HILL will procure the label printer and printing supplies. The design for the labels will be developed in cooperation with PCRWRD staff. Our work will include the installation of auxiliary mounting plates on equipment that is too small to accommodate the standard 4"x6" arc flash warning labels.

Phases of Work
The work is divided into three phases:

- Phase I - Facilities 32, 33, 34, 35, 36, 37, 38, 40 and 60
- Phase II - Facilities 4, 5, 6, 7, 9, 15 (partial), 22, 23, 46, 48, 50, 52, 58, 63, 66, 70, 76, 82, and 84
- Phase III - Facilities 1, 2, 8, 10, 11, 12, 13, 14, 15 (remainder), 16, 17, 20, 24, 25, 26, 28, 30, 54, 80, 85, 86, and 88

A report will be prepared to present the results of the arc flash calculations along with conclusions and recommendations. The PTW arc flash study report output provides data on:

- Fault current levels (bolted and arcing faults)
- Protective device delay time and opening time
- Arc flash boundary distance
- Working distance
- Incident energy
- Required protective clothing category

The report will identify the "as-found" arc flash characteristics of the equipment under study. It will also present recommendations for equipment changes that may be made to reduce the incident fault energy levels from faults. This, in turn, can reduce the required protective clothing category.

Compensation

The budget for this work is included as Attachment No. 1. This work will be completed on a time and materials reimbursable basis, with a 10% fee applied to actual labor costs. No fee shall be included on direct costs.

ATTACHMENT 1 - Fee Proposal - September 18, 2013
Pima County Regional Wastewater Reclamation Department
Ina Road WRF - Capacity and Effluent Quality Upgrade Project
Services During Construction
Change Order August 2013

	Description	Estimated CH2M HILL Labor Hours										
		Project Manager Williams	Senior Eng/Prof Engleson	Staff Eng Phillips	Junior Eng Greeley	Staff Tech Roush	Office/ Acctg Nett	Estimated Task Labor Hours	Estimated Task Total Labor	Other Direct Costs	Subconsultants	Total
Task 1	**Project Management**	**484**	**0**	**520**			**854**	**1858**	**$ 309,019**	**$ 41,000**	**$ -**	**$ 350,019**
1.01	Project Administration	480		360			830	1670	$ 278,031			
1.02	Communications	0		160			8	168	$ 28,170			
1.03	Coordination	4		0			16	20	$ 2,817			
1.04	Preconstruction Conference	0	0	0				0	$ -			
1.05	Partnering	0	0					0	$ -			
EX	Expenses									$ 41,000		
Task 6	**Capacity and Effluent Quality Upgrade**		**0**	**1535**			**376**	**1911**	**$ 303,598**	**$ -**	**$ -**	**$ 303,598**
6.01	Submittal review		0	300			85	385	$ 60,617			
6.02	RFIs and clarifications		0	300			85	385	$ 60,617			
6.03	Modifications		0	435			124	559	$ 87,981			
6.04	Document tracking			500			82	582	$ 94,383			
EX	Expenses											
Task 8	**Electrical Upgrade**		**106**	**340**			**234**	**712**	**$ 110,647**	**$ -**		**$ 110,647**
8.01	Submittal review	0	32	85		8	59	184	$ 28,879			
8.02	RFIs and clarifications	0	32	85		8	59	184	$ 28,879			
8.03	Modifications	0	10	85		8	58	161	$ 24,123			
8.04	Document tracking	0	32	85		8	58	183	$ 28,767			
EX	Expenses											
Task 10	**On-Site DP Services**	**120**	**40**	**860**			**8**	**2617**	**$ 361,536**	**$ -**	**$ -**	**$ 361,536**
10.01	Site visits/factory tests	120	40	860	780		8	1808	$ 272,685			
10.02	Resident engineer	0	0	0	809		0	809	$ 88,852			
EX	Expenses											
Task 11	**Closeout Phase Services**	**120**	**1144**	**3250**	**0**	**3250**	**40**	**7804**	**$ 1,261,367**	**$ -**	**$ -**	**$ 1,261,367**
11.01	Startup	0	400	0			4	404	$ 84,897			
11.02	Training	0	400	0			4	404	$ 84,897			
11.03	O&M Manual	80	280	0	0	0	32	392	$ 83,381			
11.04	Final completion inspection		0					0	$ -			
11.05	Closeout file and records			0			0	0	$ -			
11.06	Closeout workshop	40	64	0			0	104	$ 23,863			
11.07	Record drawings			3250		3250		6500	$ 984,329			
EX	Expenses											
Task 12	**Post Construction Phase Services**		**0**	**700**			**165**	**1924**	**$ 259,448**	**$ -**		**$ 259,448**
12.01	PC oncall operations assistance	0	0	0			0	0				
12.02	PC final arc flash	0	0	700	819	240	165	1924	$ 259,447			
	Total Hours	**724**	**1290**	**7205**	**0**	**3250**	**1677**	**16826**				
	Amendment 10 Appendix "B" Calculation Error								**$ 9,821.88**			
	Total								**$ 2,615,436.88**	$ 41,000.00	$ -	$ 2,656,436.88

APPENDIX "B" REVISION 9/18/2013

I. COMPENSATION SCHEDULE – COST PLUS FIXED FEE, NOT TO EXCEED

TASK			Budget
Phase 1 - Preliminary Engineering Services			**$5,533,836.00**
Task 1 Project Management		$562,575.00	
Task 2 Permitting Assistance		$139,197.00	
Task 3 Interim Biosolids		$1,753,168.00	
Preliminary Design, Field & Pilot Test, Schematic Design	$628,562.00		
Design Development, Contract Documents, Final Documents	$1,124,606.00		
Task 4 Preliminary Design		$843,578.00	
Task 5 Field Investigation		$84,512.00	
Task 6 Schematic Design		$1,413,039.00	
Other Direct Costs		$427,767.00	
Subconsultants		$310,000.00	
Phase 2 - Final Design Services			**$7,823,151.72**
Task 1 Project Management		$708,603.00	
Task 2 Permitting Assistance		$417,590.00	
Task 7 Design Development		$2,299,650.00	
Task 8 Contract Documents		$2,638,792.00	
Task 9 Final Documents		$987,004.00	
Other Direct Costs		$448,874.00	
SubConsultants		$0.00	
Amendment 9 - Adjustment		$322,638.72	
Phase 3 - Construction Phase Services (Allowance)			**$11,552,009.00**
Amendment # 5			**$214,561.16**
CO # 6 – Additional Headworks Replacement and Odor Control DES		$216,200.00	
Amendment #9 - CO # 6 – Additional Headworks Replacement and Odor Control DES Adjustment		($128,834.00)	
CO # 9 – New Switchgear Building DES		$300,099.00	
Amendment #9 - CO # 9 – New Switchgear Building DES Adjustment		($193,803.84)	
WET Testing and Disinfection By Product Formation Bench Testing		$20,900.00	
Amendment # 7			**$651,741.00**
Aqueous Ammonia Feed System		$156,619.00	
Electric Sluice and Slide Gate Actuators		$18,960.00	
Site Security Improvements		$324,951.00	
46 kV Substation Design		$151,211.00	
Amendment # 8			**$2,174,428.00**
Existing Process Improvements		$372,255.00	
Miscellaneous Plant Improvements		$1,410,077.00	

	Thermal Energy Facility	$392,096.00	
DP Fixed Fee (Phases 1 & 2)			**$1,540,111.00**
Monthly Fixed Fee			
Phase 1	Preliminary Engineering Services – Monthly Fixed Fee Allocation	$34,575.00	
Phase 2	Final Design Services – Monthly fixed Fee Allocation	$50,929.00	
Deliverable Fixed Fee			
Phase 1			
1.9	30% Cost Estimate - Interim Biosolids	$4,620	
1.9	60% Cost Estimate - Interim Biosolids	$7,520	
1.9	95% Cost Estimate - Interim Biosolids	$8,630	
1.9	100% Cost Estimate - Interim Biosolids	$3,228	
1.9	10% Cost Estimate	$1,050.00	
2	Permit Applications Complete and Submitted to Agency - Biosolids	$6,031	
3.4	30% Schematic Design Report - Biosolids	$27,238	
3.5	60% Design Development Documents - Biosolids	$18,913	
3.6	95% Construction Documents - Biosolids	$21,702	
3.7	100% Contract Documents - Biosolids	$8,117	
4.7	Final Preliminary Design Report	$36,555	
5	Field Investigations Complete	$3,662	
6.13	Final Schematic Design Report	$61,232	
Phase 2			
1.9	60% Cost Estimate	$11,916	
1.9	95% Cost Estimate	$13,674	
1.9	100% Cost Estimate	$5,115	
2	Permit Applications Complete and Submitted to Agency	$18,095	
7	Design Development Documents	$99,650	
8	Contract Documents	$114,345	
9	Final Contract Documents	$42,770	
Amendment #5 DP Fixed Fee			**$62,300.00**
Amendment #7 DP Fixed Fee			**$51,830.00**
Amendment #8 DP Fixed Fee			**$236,405.00**
Total Compensation (Not to Exceed)			**$29,840,372.88**
Owners Contingency			**$129,967.00**
Total Contract Amount			**$29,970,339.88**

III. INVOICING

A. Invoice Transmittal

Invoices shall be submitted monthly, prior to the Monthly Progress Meeting, to the PM/CI, with appropriate supporting data and documentation and in a format as prescribed by the Owner. (Acceptance of the invoice at this meeting is not mandatory. The PM/CI may delay approval for up to 5 work days to review the Progress Report and invoice.) The invoice shall tabulate the costs associated with each individual task. Any invoice which lists a requested payment for any individual task beyond the current approved task budget will be rejected. All Task (deliverables) and Subcontracted Service costs shall be appropriately documented. The PM/CI shall review and check the invoice to determine if it is complete and acceptable; if it is determined to be complete and acceptable, the PM/CI will approve the invoice and forward it to Owner for processing and payment.

B. Fee Schedule

Invoicing fees will be in accordance with the Compensation Schedule and Fee schedule in Section I of this appendix. Any changes in the compensation schedule or fee schedule will have prior written approval of Owner.

C. Invoice Summary

Due to this Contract including work under several separate Owner projects, DP shall include a summary page which shows amount expended each month for each project. The summary page shall be in the format similar to the one shown below and include the listed projects.

APPENDIX "B", CONTINUED

II. COMPENSATION

A. Task Budgets

The Compensation Schedule shall contain the negotiated cost allocations for each individual task. The compensation schedule shall be used to monitor cost expenditures. Once each individual task budget is agreed to it may not be changed except as noted in paragraph II.B below.

B. Cost Adjustments

The compensation schedule presented above is an estimate of the level of effort required to complete each task within each Phase. It is acknowledged that as such, the actual level of effort for each task within each Phase may change. If, for valid reason(s), the DP notifies the PM/CI and Owner that the compensation schedule needs to be adjusted Owner, will consider modifying task cost allocations as may be requested by the DP. After Owner approval the PM/CI and the Owner will work with the DP to process and approve adjustments in a reasonable time and in a reasonable manner. No adjustment of costs between tasks may be made without Owner's written authorization. The total not to exceed compensation for this Contract may be increased only by formal amendment to this Contract.

It is understood, however, that the actual work scope of Phase 2 - Final Design is dependent upon the work effort results of Phase 1 - Preliminary Design and thus the actual cost for Phase 2 can not be completely defined until the Project to be actually designed is agreed to by the OWNER as a result of the DP's Phase 1 work effort.

For the purposes of estimating the cost of Phase 2 and based upon the Preliminary Engineering Information contained in Attachment A to the OWNER's Solicitation for Qualifications Number #0801125, the DP has estimated that it will take 1212 construction contract drawings to adequately describe the Project for CMAR construction. Should the scope of the Project, as a result of Phase 1 Preliminary Design work effort, result in a design work effort requiring more than 1235 or less than 1185 drawings being required to describe the Project for the CMAR to construct, the OWNER and DP agree to negotiate in good faith an equitable adjustment to the cost and fee for Phase 2. Any adjustment to the cost and fee shall be agreed to by Owner and DP prior to DP commencing any work under Phase 2 – Final Design.

C. Fixed Fee

The monthly allocation of the fixed fee, as shown in the compensation schedule, shall be paid each month contingent upon the DP having provided all scheduled deliverables due prior to the invoice date identified in the Scope of Work or Baseline Project Schedule. If the Scope of Work and Baseline Project Schedule do not have any deliverables for the month in which the costs are incurred and all previous months deliverables have been delivered, the DP will invoice for the fixed fee and be paid the fixed fee in accordance to the Compensation Schedule in Section I of this appendix.

The deliverables portion of the fixed fee, as shown in the compensation schedule, shall be paid upon successful completion of each task deliverable listed.