REQUEST FOR BOARD ACTION

ITEM NO. 22.

DATE OF MEETING: August 2, 2010

REQUESTED BY: Michael G. Mack, Director, PCU

SHORT TITLE: Resolution Approving Amendment # 1 to the Existing Professional Services Agreement and Authorizing a Change Order to Camp, Dresser, McKee (CDM) for Professional Services Related to the Design and Construction of a New Surface Water Treatment Plant and Transmission Main.

BACKGROUND: On April 21, 2008, Pender County entered into an Agreement with Camp Dresser & McKee (CDM) for professional services related to the design, permitting, and construction inspection for the construction of a new 2 MGD Surface Water Treatment Plant and Transmission Main to serve the County's Water Districts. The total amount of the contract was $1,333,784.

During the preliminary design discussions, staff directed CDM to design the water plant to include the necessary infrastructure in the first phase of construction to treat up to 6 MGD. The base infrastructure, buildings, and plant footprint are now designed to support a 6 MGD treatment facility and 24" finished water transmission main. In accordance with the USDA-RD fee schedule and Agreement Form for "Basic Services", CDM's compensation for Engineering Services is to be based on a percentage of the construction costs for the project. The original agreement and associated Basic Services cost were based on the estimated cost of $14,100,000 for the construction of the 2 MGD project. Therefore, CDM was to be compensated an amount equal to 5.76% or $812,160 for Basic Services. In accordance with the adjusted construction cost estimate of $26,900,000 for the 6 MGD WTP and 24" Transmission Main, CDM's compensation for Basis Services needs to be increased to $1,354,240 (5.03% of estimated construction cost). In addition to the Basic Services component of the engineering agreement, there is $421,624 for Construction Inspection services and $100,000 for Additional Services to include Subsurface Investigations ($75,000), Easement preparation ($10,000), and Wetlands Delineation ($15,000). Staff is recommending the Additional Services allowance also be increased $100,000 for additional Subsurface Investigations ($25,000), extensive additional effort required for Easement preparation ($60,000), and additional Wetlands Delineation ($15,000).

In addition to the additional design work, CDM was also directed to include miscellaneous tasks that were not included in their original scope of work or Agreement. These efforts were added to ensure the facility and other interrelated components of the project were addressed and viable to

meet the future demands of the system. These items included the following extra out-of-scope tasks and associated costs:

1) Design of SCADA Operations Control System for a 6 MGD plant ($54,000)
2) Update the Water Demand Projections from the 2006 Water Master Plan ($5,986)
3) Water System Modeling of the transmission main and distribution system ($10,846)
4) Interbasin Transfer Regulations ($3,745)
5) Coordination and Design revisions to accommodate Pender Commerce Park Wastewater Treatment plant relocation ($11,154)
6) Additional Permitting Support ($9,059)
7) BASF Wellfield Support ($1,233)

The net increase to the engineering agreement is $738,103.

As part of the USDA-RD Letter of Conditions, Pender County must expense the first $2,300,000 of project costs before USDA-RD loans and grants can be used. Funds for these increased allowance are available in the Water Treatment Plant Capital Project Fund (# 83-407490) and staff is recommending approval of the Amendments.

SPECIFIC ACTION REQUESTED: The Board of Commissioners is requested to approve Amendment # 1 to the existing Professional Services Agreement and authorize a Change Order to Camp Dresser & McKee (CDM) in the amount of $738,103 for the Pender County Surface Water Treatment Plant Project.

COUNTY MANAGER'S RECOMMENDATION

Respectfully recommend approval.

Initial

RESOLUTION

NOW, THEREFORE BE IT RESOLVED by the Pender County Board of Commissioners that:

Amendment # 1 to the existing Professional Services Agreement is approved and a Change Order to CDM in the amount of $738,103 is authorized.

Account # 83-407409	WTP Capital Project Fund	$738,103

The Chairman/County Manager is authorized to execute any document necessary to implement this resolution.

AMENDMENTS:

MOVED_____ SECONDED_____

APPROVED_____ DENIED_____UNANIMOUS

YEA VOTES: Tate___ Blanchard ___ Brown ___ Rivenbark ___ Williams ___

_____ 08/02/2010
Jimmy T. Tate, Chairman Date

_____ 08/02/2010
ATTEST Date

AMENDMENT No. 1 TO THE AGREEMENT
BETWEEN
OWNER AND ENGINEER FOR
PROFESSIONAL SERVICES - FUNDING AGENCY EDITION

FURTHER DESCRIPTION OF BASIC ENGINEERING SERVICES,
AND RELATED MATTERS

This is Amendment No. 1 to the Agreement signed by the County on the 21st day of April in the year 2008 by and between Pender County (OWNER) and Camp Dresser & McKee (ENGINEER or CDM) for professional services related to construction of a new surface water treatment and transmission main in Pender County, NC. Financial assistance for this project is expected to be provided by USDA - Rural Development (AGENCY), a governmental entity. Nothing herein creates any contractual relationship between the AGENCY and ENGINEER.

OWNER, ENGINEER, and AGENCY agree that the above referenced Agreement is amended as of the _____ day of _____ in the year 2010 as follows:

Since the Pender County Surface Water Treatment Plant is now understood to need to be 6 mgd in the near future, the first phase of construction will include the infrastructure to support the 6 mgd plant. This amendment adjusts the scope and cost of the preliminary design, design, observation and construction phase services for such a plant.

The buildings and structures are now to be designed to support a 6 mgd facility as described in detail in the August 2009 Preliminary Engineering Report Amendment by CDM for the Surface Water Treatment Plant and Transmission Main.

2. **The responsibilities of the OWNER as given in Exhibit B are amended to include the following:**

   No changes.

3. **The time periods for the performance of ENGINEER's services are amended as follows:**

   Schedule is unchanged by this amendment.

4. **Payments to ENGINEER for services and reimbursable expenses as given in Exhibit C is amended as set forth below:**

   Exhibit C, paragraph C.2.01 (A)(1) shall be modified as follows: Replace "$ 14,100,000 construction cost, will be $ 812,160" with $ 26.9 million construction cost, will be $ 1,354,240."

Exhibit C, paragraph C.2.05 (A)(1) The allowance of "$ 100,000" is increased to " $ 200,000" with breakdown as follows. Increase C.2.05(A)(2) subsurface investigation allowance from "$ 75,000" to "$ 100,000". Increase C.2.05(A)(3) easement preparation allowance from "$ 10,000" to "$ 70,000". Increase C.2.05(A)(4) wetlands delineation allowance from "$ 15,000" to "$ 30,000".

Exhibit I shall be modified as follows: On page 1, replace"2 million-gallon-per-day (mgd) surface water plant" with "2 million-gallon-per-day (mgd) surface water plant designed with full infrastructure for expansion to 6 mgd by equipment addition" and replace "18 inch diameter finished water transmission main" with " 24 inch diameter finished water transmission main (bid alternate 20 inch diameter) up US 421 and 20" diameter along NC 210 to existing 12 inch pipe as shown in the Preliminary Engineering Report Amendment".

Exhibit I, page 2 paragraph "2", replace "Administration, Control and Laboratory Facilities" with "Administration, Control, Laboratory and Maintenance Facilities" and near the end of paragraph "2" replace "Figure I-1 Control/Lab Building attached" with "Figure 4-3 from the August 2009 Preliminary Engineering Report Amendment by CDM for Surface Water Treatment Plant and Transmission Main. The maintenance building shall be a separate performance specification pre-engineered metal building is to be approximately 82 foot by 41 foot in size. The maintenance building is only to have its floor plan shown in the contract drawings as remaining details are to be by the building manufacturer which will be described by specifications."

Exhibit I, page 2, paragraph "3", replace "2 mgd surface water treatment plant" with "2 mgd surface water treatment plant designed with full infrastructure for expansion to 6 mgd by equipment addition".

Exhibit I, page 2, paragraph "7", replace "18 inch diameter finished water transmission main" with "24 inch diameter finished water transmission main (bid alternate 20 inch diameter) up US 421 and 20" diameter along NC 210 to existing 12 inch pipe as shown in the Preliminary Engineering Report Amendment"

Throughout Exhibit I, replace the easement allowance of "$ 10,000" with "$ 70,000", and replace the wetlands delineation allowance of "$ 15,000" with "$ 30,000".

IN WITNESS WHEREOF, the parties hereto have executed this Amendment to the Agreement to be effective as of the date first above written.

OWNER:

Pender County, North Carolina

By: _____

Title: Chairman
Board of Commissioners

Date: _____

ENGINEER:

Camp Dresser & McKee

By: J. Brenan Buckley, P.E.

Title: Principal

Date: _____

AGENCY CONCURRENCE:

AGENCY: USDA – Rural Development

By (Signature): _____

Typed Name: Brian C. Noll

Title: _____

Date: _____

EXHIBIT A TO THE AGREEMENT
BETWEEN
OWNER AND ENGINEER FOR
PROFESSIONAL SERVICES

Engineer's Services, Owner's Responsibilities, Time for Performance, Method of Payment, and Special Provisions.

This is Exhibit A to the Agreement signed _____, 2010 by and between Pender County (OWNER) and Camp Dresser & McKee (ENGINEER or CDM) for professional services related to Addition of SCADA and Miscellaneous Items to Pender County Surface Water Treatment Plant in Pender County, NC.

OWNER and ENGINEER agree that the above referenced Agreement is amended as follows:

1. Engineer's Services:

Task 1 - Design of SCADA System

Since the Pender County Surface Water Treatment Plant is now understood to need to be 6 mgd in the near future, we recommend a higher level of control sophistication to assist in operations and maintenance and thus save money and provide better operations long-term. The current scope does not include a Supervisory Control and Data Acquisition (SCADA) System. Consequently, all controls would be at each piece of equipment across the plant with manual adjustments. A SCADA system allows the control adjustments to be made in a central control room by computer. This allows alarms directly to the operator when any piece of equipment goes outside of programmed acceptable ranges or fails to run. Also, having all the controls in a SCADA computer allows for monitoring and saving lots of useful data like run time on each of the motors for tracking when to do maintenance.

Since the cost of computers and other electronics keeps getting lower and lower for more functionality, the cost of SCADA engineering is higher than that of standard services. Adding a SCADA system takes much more instrumentation drawings and effort in design and construction. All of the instrumentation also needs electrical engineering to get power and control wiring to them and to connect them to the control system. The additional construction cost is estimated to be about $ 500,000. Deducting from the cost to do this SCADA work the amount that USDA will cover leaves just a $ 54,000 addition for an enormous amount of benefits.

The description of the instrumentation system design if SCADA is added is as follows:

The Pender County Surface Water Treatment Plant (WTP) will be equipped with an open-architecture control system consisting of Allen-Bradley ControlLogix series or equal programmable logic controllers (PLCs) for control over unit processes connected by an Ethernet network, and supervisory PC servers and workstations running Rockwell RSView

Human Machine Interface (HMI) software, and any additional software applications required for historical data storage and retrieval, reporting, and other functions.

All plant processes will be monitored and controlled by the new system. The control philosophy of the system is to create three distinct control layers where appropriate- PC/HMI, PLC and local/hardwired controls - in which each layer is supervised by, but does not depend on, the layer above it, e.g., the PC supervises the entire PLC network, but if the PC fails, then PLC controls will still function automatically on their own. The system will be designed for total automation, but full manual override will be available at all three control layers.

Field instruments and controls will be provided for all plant process areas. Fieldbus technologies will be employed wherever possible in the work. Field instruments will be connected to the PLC via a Profibus data highway, utilizing single twisted-pair cables for an entire bus rather than a large number of individual signal wires. This will make available to the entire plant control system not only the process instrument reading, but also instrument health and configuration data. Drives, power monitors, and other electrical gear will be connected to the PLC via DeviceNet or similar industry-standard data highway, so that their data can be displayed and recorded by the central control system.

New PLCs will be installed and distributed amongst the various process units. PLCs used for control of critical processes will be equipped with redundant processors. A ring of fiber optic cable will be used to form a new dual redundant Ethernet network, the Process Control Network, for PLC data traffic. Fiber optic cable will be extended to all new PLC locations as needed. All connections will be made using existing patch panels where available; new patch panels will be installed to serve new PLC locations. This new network will be used to connect all new PLCs as well as all existing PLCs.

Each new PLC will be mounted in a new control panel. Each control panel will include an enclosure suitable for the local environment, uninterruptible power supply (UPS) and battery backup, surge suppressor devices and all ancillary equipment. Where they are mounted far from PC workstations, PLC control panels will include a touchscreen-style operator interface panel (OIP) for local access to PLC alarms, status indicators and controls.

All equipment control panels furnished by vendors that include PLCs should be constructed so as to be as compatible as possible with these requirements. PLCs should be Allen-Bradley ControlLogix or CompactLogix, for ease of maintenance and communications between processors, and should include Ethernet communication capability.

A central control room will be outfitted with new supervisory PC equipment. Five PC servers will be furnished. Two will be redundant Supervisory Control and Data Acquisition (SCADA) Servers that will poll all PLCs on the network and process all PLC data. Two will be redundant Domain Controllers and Historical Servers, governing the local Windows network and archiving all historical data. One will manage the plant database and the generation of reports. The Primary Domain Controller will include a RAID controller and at least four hard drives. All servers will be mounted in a rack in a secure area; a UPS and networking hardware will also be located here. Two PC

Workstations for operator use will be located on a console in the control room proper. New printers will be furnished for capturing reports and trends. A PC laptop will be furnished for troubleshooting and programming PLCs, HMI, and the network, with a docking station on the control room console.

New graphic interface screens, status and alarm points, databases, reports, and other functions will be developed to represent, monitor and control all plant processes.

Task 2 – Miscellaneous Extra Tasks

Over the course of the design, miscellaneous out-of-scope tasks had to be completed. Their cost also requires authorization beyond the USDA contract as follows:

A. Water Demand Projections

CDM developed water demand projections to determine the appropriate capacity and service life for design of the proposed water treatment plant. Use of projections included in previous studies developed for the County would have resulted in a treatment plant that would require expansion immediately following the completion of construction of the proposed 2 mgd facility in 2012. These updated demand projections were critical to securing USDA Rural Development's financial support for the 4 mgd option (readily expandable to 6mgd) that was selected for design. CDM developed a technical memorandum documenting these findings and prepared and presented a PowerPoint presentation for the Pender County Board of Commissioners on March 3, 2009. Total Cost - $5,986

B. Water System Modeling

CDM developed a water system distribution model of the transmission system from the proposed water treatment plant to the Rocky Point / Topsail Service Area to facilitate the design of the system when the County's consultant was unable to provide the water system model developed as part of the Water System Master Plan. This model was developed using public-domain EPANET water system modeling software and will be made available to the County. The system model included appropriate nodes for assessing future demand load points, storage tanks, pump stations, the supply from the Town of Wallace, and other critical features. The model was also used to appropriately size the parallel pipe system required from the end of Phase I of this project to supply the Rocky Point / Topsail system with flows in excess of 2 mgd in the near future. Total Cost - $10,846

C. Interbasin Transfer Regulations

CDM assisted the County with the review and interpretation of the NC general statutes governing the transfer of surface waters from one river basin to another (NCGS 143-215-22L) as they pertain to the ability for the County to serve the Rocky Point / Topsail and future service areas that are located in river basins or subbasins outside of the Cape Fear Basin. The Pender County service area includes four such basins or subbasins, complicating the water supply management approach. CDM's

services included review of the regulations, attending one meeting with Division of Water Resources staff, and development of potential management strategies to comply with the regulations. CDM also attended at no cost to the County various NC Senate and House committee meetings to monitor the progress of pending legislation that may have impacted the County's need for an interbasin transfer certificate. Total Cost - $3,745

D. Coordination and Design Revisions for Proposed WWTP

CDM assisted the County and its consultants and partners with the development of plans to co-locate a proposed wastewater treatment plant (WWTP) immediately adjacent to the proposed water treatment plant. CDM's services included developing alternatives to the original site layout of the water treatment plant (WTP), reviewing and incorporating the proposed WWTP layout into the site planning for the WTP, modifications to the grading plan to facilitate co-locating the WWTP, coordination with County's consultant to revise the stormwater management and grading plan to facilitate its use for both projects, and coordination with the County's consultant to plan and design the combined wastewater outfall proposed for the WTP and WWTP. CDM also revised grading plans close to the end of design to accommodate a revision to the proposed stormwater management approach. Total Cost - $11,154

E. Additional Permitting Support

CDM incurred costs above those anticipated to support the County's efforts to obtain an NPDES permit that met the expectations of the NCDENR Wilmington Regional Office. Total Cost - $9,059

F. BASF Wellfield Support

CDM assisted the County with planning to include the BASF wellfield in the project. Responsibilities included developing a scope of work for assessing the capabilities of the BASF wellfield to support the County's needs as a supplemental water source, evaluation of existing as-built information from BASF, and planning for coordination with the design drawings. Design of the connections, metering, and appurtenances from the wellfield to the raw water intake pipe of the water treatment plant are included in the basic agreement by virtue of the cost of construction. Total Cost - $ 1,233

2. **The responsibilities of the OWNER are amended to include the following:**

No changes.

3. **The time periods for the performance of ENGINEER's services are amended as follows:**

Design shall be complete by June 2010.

4. **Payments to ENGINEER for services and reimbursable expenses as given in Exhibit C is amended as set forth below:**

Owner will compensate Engineer with lump sum payments billed monthly in proportion to the amount of work completed up to $ 54,000 for SCADA related engineering beyond what is covered by the USDA contract and $ 42,023 for the miscellaneous tasks described herein beyond the amount paid by USDA.