

February 6, 2018

Mr. Kyle Manning
Engineering and Environmental Services
Durham County
5926 Highway 55 East
Durham, NC 27713

Reference: Proposal for pH Adjustment System
Rougemont Water System
Durham County
PWS ID No. 40-32-018

Dear Mr. Manning:

Dewberry Engineers Inc. (Dewberry) is pleased to submit this proposal to assist with evaluation, design and permitting for the above referenced project. This proposal has been prepared based upon our recent correspondence and information provided in Durham County's Request for Proposal (RFP) No. 18-011.

UNDERSTANDING OF PROJECT

Dewberry understands that Durham County is the owner and operator of the Rougemont Water system located in Durham County. The water system became operable in September 2016 and serves 32 households with two, 20 gpm potable groundwater wells. The current treatment system includes disinfection and corrosion control using sodium hypochlorite and zinc orthophosphate, respectively. The distribution system consists of two (2) 10,000 gallon hydro-pneumatic tanks and approximately 11,100 feet of 6-inch ductile iron water main.

Distribution sampling events performed in August and September 2018 identified acidic water conditions (i.e.; pH < 7.0) in the hydro-pneumatic tanks and distribution system with average pH levels at 6.70 and 6.79 units, respectively. Lead and Copper sampling events have indicated detectable lead and copper concentrations in tap water; some copper samples were above the regulatory Action Level of 1.3 mg/l requiring action.

As a result of elevated copper samples, an Optimum Corrosion Control Treatment (OCCT) study was performed by Durham County and published on June 29, 2017. The OCCT study identified other water treatment facilities located nearby with similar phosphate based corrosion inhibitors, as well as pH/Alkalinity adjustment systems. The conclusion of the OCCT study was to adjust existing corrosion control treatment by increasing the current dose of phosphate based corrosion inhibitor, a 3.75% solution of zinc orthophosphate, and monitoring results.

In response to the OCCT study, the North Carolina Department of Environmental Quality (NCDEQ) Division of Water Resources issued a letter dated October 24, 2017 approving the following OCCT methods:

- Increasing pH using soda ash in the range of 7.2 to 7.8 s.u. at the entry points and the distribution system.
- Continue orthophosphate based corrosion inhibitor to maintain a residual of 1.0 mg/l in the distribution system.

It is our understanding that the scope of work shall include reviewing current operational records, OCCT methods, and existing water quality data to develop a design narrative for the installation of a soda ash pH neutralization system that meets Durham County's current operational requirements and complies with the approved treatment methods identified by NCDEQ. If Durham County is in agreement with a treatment approach identified in the design narrative, we understand that Durham County desires for Dewberry to create design documents for permitting and construction. Such services shall also include construction administration and observation.

SCOPE OF SERVICES

Dewberry proposes to perform the scope of service as described below:

Task 1 – Design Narrative and Analysis of Current System

As in initial activity in Task 1, Dewberry and Durham County will participate in a project kickoff and pre-design meeting at the well site. During the kickoff meeting, Dewberry will review project background, scope and schedule. We will also seek to establish lines of communication and will conduct a walk-through of the existing well site and treatment system.

Following the site visit, Dewberry will review existing information provided by Durham County and will submit an information request letter to Durham County if any other additional data is required for the engineering design analysis. To date Dewberry has received the following information:

- RFQ No. 18-011 – pH Adjustment System for Rougemont
- August, September, and October Monthly Operating Reports (MORs)
- Evaluation Form for CCT for Small/Medium Systems dated June 29, 2017
- NCDEQ OCCT Approval Letter dated October 24, 2017.

Dewberry anticipates requesting the following information (if available):

- Projected future demand and service areas
- Approved Permitted Well Yields
- Results of CCT program, i.e.; effect increasing zinc orthophosphate dose rate
- Raw and treated orthophosphate concentrations
- NCDEQ Approved Construction Drawings or Final Record Drawings from when the well was constructed.

After receipt and review of available data and information, the project requirements, design parameters and objectives will be summarized in a Design Narrative and shared electronically with Durham County. The intent of the narrative is to identify the required soda ash pH neutralization feed equipment and layout within the existing well house, and to identify the proposed treatment system meets current regulatory and operational requirements such as required daily visits and operator classification. We propose to review the narrative via teleconference to discuss Durham County's comments. After the teleconference we will incorporate mutually agreed upon changes to the narrative, issue a final draft of the Design Narrative. Upon Durham County's approval of the Design Narrative, Dewberry will commence the design engineering phase identified in Task 3 below.

Task 2 – Development of Concept Level Capital and Operating Cost Estimates

Dewberry will develop preliminary capital and operating cost data for the proposed treatment system identified in the Design Narrative. For capital cost data, vendor quotes will be obtained for major equipment capital costs, and installation costs will be estimated based on our recent experience and market conditions. Installation costs will be quantified using a multiplier of capital costs for major equipment.

Annual operating costs will be estimated with allowances for chemicals, maintenance, and energy. We assume that Durham County will provide site-specific unit costs for operational considerations. Capital and operating cost estimates shall be prepared concurrently with Task 1 and submitted as part of the Design Narrative.

Task 3 – Design and Permitting Phase Services

Dewberry shall prepare technical design documentation including plans and specifications for the soda ash pH neutralization system. The specifications will include adequate information for selection and purchase of materials and equipment intended for the design. The specifications will also provide directions to the Contractor for equipment installation and related testing. Dewberry proposes to provide the vendor installation specifications for the water treatment system. Other specification items will be provided as general notes on the construction packages.

Dewberry proposes to prepare the following drawings suitable for system permitting and contractor installations:

- Well House Layout
- Water Treatment System General Arrangement
- Mechanical Piping and Piping Details
- Electrical Schematic and Details

Dewberry proposes to prepare an Authorization to Construct (ATC) NCDEQ Public Water Staff (PWS) permit application and required Engineering Report. The Engineering Report will be brief and structured to meet the PWS requirements.

Dewberry proposes to make a 90% submittal package to Durham County for review and comment. We propose to host/attend a 90% design meeting to review comments and questions related to the 90% submittal. After the meeting we propose to incorporate mutually agreed upon changes and make a final permit application submission to NCDEQ.

It is assumed that Dewberry will pay any applicable PWS permit fees associated with the ATC application. Any other required or local permit applications are excluded from the scope of work.

Task 4 – Bid

Bid documents consisting of Issued for Construction (IFC) drawings and technical specifications will be developed to a level of detail sufficient for a Contractor to bid and construct the system. Drawings will be provided to Durham County in PDF format along with one set of full size drawings and two sets of half size drawings. Specifications will also be submitted in PDF format along with 2 paper sets for use by

Durham County in construction. The IFC documents will bear the seal and signature of a Professional Engineer registered in the state of North Carolina.

It is assumed that Durham County will prepare required front-end contract documents and solicit pricing from prospective bidders. Preparation of contract related specifications and bid coordination are excluded from the scope of work.

Dewberry will address bid phase requests for information (RFI) submitted by the contractor. For budgeting purposes we have included an allocation for providing written responses for one RFI at 2 hours per RFI. If the response to an RFI results in a change in the design, Dewberry will issue an Addendum to the Final plans or specifications. When bidding is complete, Dewberry will incorporate addenda issued during the bid phase into the plans and specifications and issue conformed documents for construction.

Task 5 – Construction Phase and Start-up Services

Dewberry proposes to provide construction phase and start-up services using local personnel. This shall include construction management and periodic construction observations. Dewberry assumes that construction will commence in year 2018 and be complete within 60-days. Our scope and fee is based upon a 60-day construction duration and we may request additional fees if construction extends beyond this duration.

Dewberry proposes to attend a preconstruction meeting to answer Contractor questions regarding plans, specifications, scope, and approach.

Dewberry proposes to perform shop drawing review of those items requiring engineering approval. For the purpose of this proposal it is assumed that the following items will require review and approval:

- Chemical Pumps
- Piping, Valves and Appurtenances
- Chemical Barrels
- Vendor Supplied Water Treatment Systems
- Electrical Equipment

For periodic construction observation, Dewberry proposes to perform one construction observation site visit. A field observation report will be issued for each field visit. We have also included fees for biweekly progress meetings with Durham County and Contractor for up to four (4), 30-minute conference calls.

Dewberry proposes to provide responses to Requests for Information (RFI) submitted by the Contractor during construction.

After construction is substantially complete, Dewberry proposes to assist with startup. Dewberry will coordinate with the Contractor, equipment vendors and Durham County. We have included fees for one day of startup services.

Task 6- Record Drawings and Final Certifications

Dewberry proposes to coordinate with Contractor and Durham County any required post construction water quality sampling and other required tests performed by Durham County or Contractor to verify

installation. Once verified, Dewberry shall prepare a final engineering certification and submit to NCDEQ PWS in accordance with the approved ATC permit.

Dewberry also proposes to perform a final walk-through during the same field visit as start up to observe the Contractor's installation was performed in accordance with the permitted design documents. The walk-through shall include reviewing contractor's red-line drawings to develop final record drawings, as well as generating a punch list to document any remaining items required at substantial completion to achieve final completion.

Record drawings will be developed in AutoCAD format based on the IFC drawings and red-line drawings developed in the field by the Contractor during construction. The revision block of the completed drawings will be updated to note that the drawings are "For Record." A note will be added to each drawing, and to the cover of the specifications indicating that record conditions are based on information provided by others. Final record drawings will be submitted 2 weeks after the final walk-through meeting.

FEES

Dewberry proposes to perform Tasks 1-6 on hourly not-to-exceed basis for \$34,740 as indicated below.

Task	HNTE Fee
1 – Design Narrative and Analysis of Current System	\$7,600
2 – Development of Concept Level Capital and Operating Cost Estimates	\$1,500
3 – Design and Permitting Phase Services	\$12,170
4 – Bid	\$1,960
5 – Construction Phase and Start-up Services	\$3,710
6 – Record Drawings and Final Certifications	\$7,800
Total	\$34,740

In developing this budget, we assume the following:

- Durham County shall prepare front-end contract specifications and administer bid phase for contractor selection.
- Durham County shall be responsible for sampling, testing, or data collection.
- Durham County is responsible for water quality sample collection and analysis for any pre and post construction water quality data required for engineering design and system startup and commissioning.
- Dewberry does not anticipate local permits are necessary.
- Permitting is limited to NCDEQ PWS ATC application and final engineering certification. Dewberry shall pay the required NCDEQ PWS ATC application fee.
- It is assumed that modifications to the existing well house structure, lighting, HVAC, electrical service or other building components are not required and are omitted from the scope of work.
- It is assumed that required electrical capacity for proposed treatment upgrades is available and existing power panel has a spare breakers.
- It is assumed that no site modifications are required for the treatment system installation, and that the proposed treatment system shall be installed in the existing well house footprint.
- Survey work is excluded from the scope of work.
- No secondary containment for soda ash required.

Dewberry anticipates that the County's terms and conditions will be utilized. If the scope of work listed above is acceptable, please forward a copy of the County's terms and conditions for our review and comment.

Sincerely,

Dewberry Engineers Inc.



Steven Hilderhoff, PE
Associate

cc: Michael Poulos PE, Dewberry
Leigh-Ann Dudley, PE, Dewberry
Stephanie Brixey, Durham County

Attachment: Dewberry Rate Schedule

Dewberry is an equal opportunity employer and as such complied with Section 202 of Executive Order 11246 as amended.

This proposal includes information that shall not be disclosed outside of the CLIENT and shall not be duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of, or in connection with, the submission of this information, CLIENT shall have the right to duplicate, use, or disclose the information to the extent provided in the resulting contract. This restriction does not limit CLIENT's right to use information contained in this information if it is obtained from another source without restriction.

Standard Hourly Billing Rate Schedule

Dewberry	Hourly Rates
Professional	
Principal	\$280.00
Architect I, II, III	\$85.00, \$100.00, \$115.00
Architect IV, V, VI	\$130.00, \$145.00, \$165.00
Architect VII, VIII, IX	\$185.00, \$200.00, \$220.00
Interior Designer I, II, III, IV	\$75.00, \$85.00, \$105.00, \$150.00
Engineer I, II, III	\$100.00, \$110.00, \$125.00
Engineer IV, V, VI	\$140.00, \$160.00, \$175.00
Engineer VII, VIII, IX	\$190.00, \$205.00, \$225.00
Other Professionals I, II, III	\$95.00, \$110.00, \$120.00
Other Professionals IV, V, VI	\$135.00, \$155.00, \$165.00
Other Professionals VII, VIII, IX	\$190.00, \$205.00, \$225.00
Technical	
Geographer/GIS I, II, III	\$85.00, \$95.00, \$105.00
Geographer/GIS IV, V, VI	\$115.00, \$135.00, \$150.00
Geographer/GIS VII, VIII, IX	\$180.00, \$200.00, \$220.00
Designer I, II, III	\$100.00, \$115.00, \$135.00
Designer IV, V, VI, VII	\$150.00, \$175.00, \$195.00, \$205.00
CADD Technician I, II, III, IV	\$70.00, \$85.00, \$95.00, \$115.00
Surveyor I, II, III	\$60.00, \$70.00, \$80.00
Surveyor IV, V, VI	\$100.00, \$105.00, \$120.00
Surveyor VII, VIII, IX	\$140.00, \$165.00, \$185.00
Other Technical I, II, III	\$60.00, \$80.00, \$100.00
Other Technical IV, V, VI	\$115.00, \$130.00, \$150.00
Construction	
Construction Professional I, II, III	\$120.00, \$135.00, \$155.00
Construction Professional IV, V, VI	\$180.00, \$200.00, \$215.00
Inspector I, II, III	\$80.00, \$95.00, \$110.00
Inspector IV, V, VI	\$130.00, \$140.00, \$155.00
Administration	
Admin Professional I, II, III, IV	\$65.00, \$85.00, \$100.00, \$110.00
Non-Labor Direct Costs	Cost + 15%

COMPANY CONFIDENTIAL AND PROPRIETARY

