City of North Augusta
Department of Public Services
North Augusta, South Carolina
Office: (803) 441-4325
Fax: (803) 441-4326
Website: http://www.northaugusta.net

Bid No: P385-4280-2020

Release Date: 12/11/2019
Opening Date: 01/17/2020

INVITATION TO BID

SCADA System and RTU Improvements – Phase II

The City of North Augusta will be accepting sealed bids from Instrumentation and Control System Contractors to perform work involving the replacement of portions of existing proprietary radio telemetry system equipment.

Sealed bids for this project will be opened publicly and read aloud at 1:00 p.m. on January 17, 2020 at 130 Hammonds Ferry Road North Augusta, SC 29841.

All envelopes must be clearly labeled with the project name, item or service being sought, and the date the bids are due. If you send your bid by mail you should put it into a separate sealed envelope, labeled as required, inside the mailing envelope to safeguard against it being opened in error.

The City of North Augusta is committed to a fair, open process for interested parties to receive information about the Project and the competitive solicitation process that the City is proposing to utilize for selection of an Instrumentation and Control System Contractor.

All inquiries relating to this sealed bid should be addressed to:

City of North Augusta
Department of Public Services
SCADA System and RTU Improvements – Phase II
Attn: Greg Shaffer.
Superintendent of Water Production
130 Hammonds Ferry Road
North Augusta SC, 29841
Phone: (803) 441-4325
Email: gshaffer@northaugusta.net

All sealed bids must be submitted to Greg Shaffer, Superintendent of Water Production, by 1:00 p.m. on 01/17/2020, in a sealed envelope clearly marked "**SCADA System and RTU Improvements – Phase II**."

Submit bids by USPS to:
Attn: Greg Shaffer
Superintendent of Water Production
Department of Public Services
P.O. Box 6400
North Augusta, SC 29861-6400

Submit bids by UPS or FedEx to:
Attn: Greg Shaffer
Superintendent of Water Production
Department of Public Services
130 Hammonds Ferry Road
North Augusta, SC 29841

The City of North Augusta will not be responsible for late mail deliveries, and no bids will be accepted after 1:00 p.m. on 01/17/2020.

The City of North Augusta reserves the right to reject any or all bids and to waive any bid formalities.

A. SCOPE

1. The scope of this work is to replace portions of the Owner's existing proprietary radio telemetry system.
2. Each existing DFS remote telemetry unit (RTU) shall be replaced with a new PLC-based remote telemetry unit utilizing an Allen-Bradley MicroLogix 1400 PLC and communicating via Ethernet/IP over a Verizon Cellular network. This work will be completed in two separate phases. Phase II of this work will include the following sites:
    a. Atomic Elevated Storage Tank
    b. Five Notch Elevated Storage Tank
    c. Sidereal Elevated Storage Tank
    d. Smithfield Elevated Storage Tank
3. Verizon cellular service will be procured by the City of North Augusta with the Instrumentation and Control System Integrator's technical advice and assistance.

B. QUALIFICATIONS

1. Training and Experience Requirements:
2. Licensing Requirements:
    a. COA as Consulting Engineering Firm in SC is required
    b. Contractor to be a licensed Electrical Contractor in SC.
    c. Work to be performed under the supervision of a PE licensed in the State of SC.
    d. Contractor to be Control System Integrators Association (CSIA) Certified.
    e. Contractor must possess a current City of North Augusta business license.
3. Insurance Requirements:
    a. **Compensation Insurance:** The contractor shall procure and shall maintain during the life of this contract, including the entire period of the contractor's warranty, workmen's compensation insurance for all of the employees to be engaged in work on the project under this contract, and in any case any such work is subject, the contractor shall require the subcontractor similarly to provide workmen's compensation insurance for all of the employees to be engaged in such work unless such employees are covered by the protection afforded by the contractor's workmen's compensation insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the workmen's compensation policy for the protection of such of his employees not otherwise protected.
    b. **Public Liability, Property Damage, and Automobile Liability Insurance:** The contractor shall take out, and maintain during the life of this contract, including the entire period of the contractor's warranty, such comprehensive general liability insurance including products and completed operations. XC and U, and the ISO broad form general liability endorsement for its equivalent thereof and automobile liability insurance as shall protect him and any subcontractor performing work covered by this contract from claims for property damage, which may arise from operations under this contract, whether directly or indirectly employed by either of them. The owner shall be listed as an additional insured. The amount of such insurance shall be as follows:
        1) **Bodily Injury Insurance** in an amount not less the $500,000 for bodily injury, including accidental death, to any one person, and subject to the same limit for each person, in an amount not less than $1,000,000 on account of one accident.

2) **Property Damage Insurance** in an amount not less the $500,000 for any one damage claim, and in an aggregate amount up to $1,000,000 during a period of twelve (12) months.

C. INSTRUCTIONS TO BIDDERS

1. Intent

It is the intent of this sealed bid to establish the specifications for SCADA System RTU Improvements for the City of North Augusta Water Distribution System. The specifications contained herein are intended to provide vendors with sufficient information to enable them to prepare an acceptable response to the request.

2. Submittals

a. The Instrumentation and Control System Contractor shall submit product data for all instrumentation and components and electrical elementaries for the new cellular remote telemetry unit (CRTU) panels.

b. The Instrumentation and Control System Contractor shall provide shop drawings for each new cellular remote telemetry unit. Such submittals shall include detailed Electrical Elementaries showing all components and interconnections, including wire numbers and terminal numbers for all panel components. The Contractor shall coordinate all final drawings for this project including Record Drawings and Instruction Manuals for all equipment furnished. The Instrumentation and Control System Contractor shall provide five (5) bound hard copies and five (5) thumb drives with PDF files of all drawings and Instruction Manuals.

3. Major Equipment To Be Supplied

a. The table below lists the major SCADA system components to be supplied by the Instrumentation and Control System Contractor for Phase I of this work.

Device Tag	Location	Comments
RTU-3	Atomic Elevated Tank	NEMA 4X, #304 stainless steel with white powder-coated exterior finish.
RTU-4	Five Notch Elevated Tank	NEMA 4X, #304 stainless steel with white powder-coated exterior finish.
RTU-5	Sidereal Elevated Tank	NEMA 4X, #304 stainless steel with white powder-coated exterior finish.
RTU-6	Smithfield Elevated Tank	NEMA 4X, #304 stainless steel with white powder-coated exterior finish.

4. Important Dates

a. Bid package released to vendors: 12/11/2019

b. Deadline for submission of proposal: 01/17/2020

c. Vendor Selected By: 02/17/2020

d. Work to begin: 02/19/2020

D. PRODUCTS

1. General

a. It is the intent of these specifications to establish the minimum requirements for the electronics, control elements, and ancillary wiring of components to be used for each Remote Telemetry Unit and for associated components, instrumentation, etc.

b. Deviations from the specific components identified below shall not be allowed without the written consent of the Owner, the City of North Augusta. Requests for deviations must be received by the City of North Augusta at least fourteen (14) days prior to the bid date. Requests for deviations must be directed to the following address:

The City of North Augusta

PO Box 6400

North Augusta, South Carolina 29861-6400

Attn: Greg Shaffer

2. Provide all necessary fuses or switches required by the instrumentation and/or hardware manufacturer for their equipment.
   a. Provide internal ON / OFF switch at all instruments that require an internal power supply.
3. Provide internal framework of each panel to permit panel lifting without racking or distortion.
4. All attachment screws, mounting hardware, and support structures are to 316 stainless steel.
5. Internal Construction
   a. Internal electrical wiring:
      1. Mount and wire panel equipment on or within the cabinet.
      2. Comply with the National Electric Code.
      3. Group wiring within the panel together with harnesses or ducts and secure to the structure.
      4. Number wiring in compliance with the numbering system used on the wiring schematics.
      5. Route power and low voltage DC signal wiring in separate wire ways.
         i. Crossing of the two signals shall be at right angles.
      6. Provide 12 AWG Type THHN/THWN power wire stranded and insulated for not less than 600 volts unless otherwise specified.
      7. Provide 1 pair 16 AWG stranded discrete control wire.
      8. Provide 1 pair 18 AWG stranded and shielded analog signal wire.
      9. Provide low-capacitance, double shield electronic communications cables consisting of twisted pairs with 22 AWG stranded conductors and PVC jacketing.
      10. Wire Colors:
         i. Line Power: Black
         ii. Neutral : White
         iii. AC Control at less than line voltage: Red
         iv. DC Control: Blue
         v. DC Common: Gray
         vi. Equipment or Chassis Ground: Green
         vii. Externally Powered Interlocks: Yellow
         viii. Hot and Circuit Breaker Open: Orange

11. Individually fuse each 4-20 mA analog signal loop.
    i. Isolate discrete inputs and outputs by indicating interposing relays.
12. Provide lightning / surge protection to protect electronic instrumentation system from induced surges propagating along the signal and power supply lines.

6. Cellular Remote Telemetry Unit

a. The PLC-based Cellular Remote Telemetry Unit (RTU) shall be an "open architecture" design using stock "off-the-shelf" components.

b. The Instrumentation and Control System Integrator shall make use of readily available products with a proven history of reliable service when used in municipal water and wastewater applications.

c. The internal components of each PLC-based Remote Telemetry Unit shall be housed in a NEMA 4X, stainless steel, enclosure with 3-point pad-lockable latch mechanism.

d. The exterior of the enclosure shall be a white powder-coated finish to protect the electronics within the enclosure from overheating due to exposure to direct sunlight.

e. The RTU enclosure will be field- mounted on a new equipment rack in a location specified by the Owner. All materials used to construct the equipment rack shall be 316 stainless steel.

f. The CCTU shall include a Sierra Wireless RV50 Wireless Gateway (10/100/1000) with Phantom Multiband Omni-directional Antenna (N Female connector) and 3 ft. Wi-Fi Antenna Cable, LMR240. If cellular signal strength improvements are required for certain sites, also provide a Weboost Cellular Booster Kit with Cellular Booster, Omni-directional Antenna, and 30 ft. of extension cable at no additional cost to the Owner.

g. Primary components of each RTU shall include:

1. Allen-Bradley MicroLogix 1400 #1766-L32BXBA (24 VDC) programmable logic controller (PLC) or most current model.
2. Sierra Wireless RV50 cellular modem/radio.
3. AC power surge arrestor.
4. 24 VDC indicating interposing relays with 5 Amp contacts to protect digital inputs.
5. 24 VDC indicating control relays with 10 Amp contacts to protect digital outputs.
6. All DC power supplies shall be 24 Volt, 4.2 Amp DC in order to reduce spare parts needs.
7. 24 VDC battery backup power supply system with two (2) 9 AH batteries.
8. Terminal strips, DIN-rail mounted.
9. Heater and thermostat (to prevent internal condensation).
10. Circuit breakers as required.
11. LED utility light.
12. GFI utility outlet.

h. Each RTU shall communicate with the existing water treatment plant's SCADA server using Verizon Wireless cellular system and Allen-Bradley's Ethernet/IP communications protocol.

i. The Allen-Bradley PLC shall support the following minimum I/O complement:

1. 20 digital (discrete) inputs;
2. 12 digital (discrete) outputs;
3. 4 analog inputs (4-20 mA or 1-5 VDC)
4. 2 analog outputs (4-20 mA into 750 ohms minimum)

j. All field wiring terminations shall be made to terminal strips capable of accommodating up to #12 AWG wire. Terminal strips shall be DIN-rail mounted.

k. All analog inputs, including spare analog inputs, shall be protected from surges using three separate levels of surge/transient suppression. The first level of protection shall be via a 1/4 Amp, 3 AG size, fast acting fuse. Secondary and tertiary protection shall be fulfilled using combination gas discharge tube and metallic oxide varistor (MOV) surge protection with current limiting resistors. Terminals shall be installed to allow each of the four analog inputs to be configured for 2-wire or 4-wire process transmitters and to produce either 4 to 20 mA or 1 to 5 VDC outputs to the PLC and any future display or signal conversion devices. Terminals shall be installed adjacent to the analog surge protection to provide 24 VDC power for connections of future 2-wire transmitters. MR Systems' Kamikaze II as manufactured by Phoenix Contact is one acceptable solution. A minimum of four (4) analog inputs shall be wired to surge protection devices and shall be ready to accommodate either 2-wire or 4-wire analog signals. Additional analog inputs shall be wired, if required, to accommodate additional field signals using an Allen-Bradley expansion I/O card.

l. All analog outputs, including spare analog outputs, shall be protected from surges using three separate levels of surge/transient suppression. The first level of protection shall be via a 1/4 Amp, 3 AG size, fast acting fuse. Secondary and tertiary protection shall be fulfilled using combination gas discharge tube and metallic oxide varistor (MOV) surge protection with current limiting resistors. Terminals shall be installed to allow each of the four analog inputs to be configured for 2-wire or 4-wire process transmitters and to produce either 4 to 20 mA or 1 to 5 VDC outputs to the PLC and any future display or signal conversion devices. Terminals shall be installed adjacent to the analog surge protection to provide 24 VDC power for connections of future 2-wire transmitters. MR Systems' Kamikaze II as manufactured by Phoenix Contact is one acceptable solution. A minimum of two (2) analog outputs shall be wired to surge protection devices and shall be ready to accommodate either 2-wire or 4-wire analog signals. Additional analog inputs shall be wired, if required, to accommodate additional field signals using an Allen-Bradley expansion I/O card.

m. All digital inputs, including spare digital inputs, shall be isolated via indicating electro-mechanical relays. Minimum contact rating for these relays shall be 5 Amps at 250 VAC. A minimum of twelve (12) digital inputs shall be connected to field wiring via DIN rail mounted terminal strips for each RTU. Additional digital inputs shall be wired, if required, to accommodate additional field signals.

n. Digital outputs shall be isolated from field wiring through terminal strips and indicating electro-mechanical relays with contact ratings of 10 Amps at 250 VAC minimum. A minimum of six (6) digital outputs shall be fully wired to interposing relays and to field terminal strips. Additional digital outputs shall be wired, if required, to accommodate additional field signals.

o. Separate DC power supplies shall be provided for the PLC, radio, and for field analog and digital inputs. All DC power supplies shall be protected via indicating 3 AG size fast acting fuses. Indicating fuse holders shall be utilized and shall be DIN rail mounted.

p. A single pole limit switch shall be mounted on the door frame of the RTU enclosure and shall be wired to a non-relay-isolated input of the RTU to provide an RTU "Door Opened" signal to the SCADA system.

q. A battery backup system shall be supplied to provide continuous 24 VDC power to the entire RTU panel. This unit shall incorporate a Delta battery backup unit, Delta 24 VDC, 4.2 Amp power supply with aluminum housing, and two (2) 9 amp-hour batteries.

r. Two (2) circuit breakers shall be provided integral to the RTU. One circuit breaker shall provide protection to the RTU's internal power supplies and the other circuit breaker shall provide protection to a Ground Fault Interrupt (GFI) duplex utility outlet.

s. An Edco AC power surge protector shall be installed integral to the RTU to provide transient and surge protection for incoming AC power.

t. An electronic heater and thermostat shall be supplied inside each RTU enclosure to prevent the condensation of water.

u. Provide one (1) Hirschmann Spider 5TX unmanaged Ethernet 5-port switch, 10/100 MB.

v. Anti-corrosion inhibitor blocks shall be mounted inside each RTU enclosure to reduce corrosion. Corrosion inhibitors shall be Hoffman Model A-HCI10E.

7. Spare Parts for PLC Hardware

a. One (1) Allen-Bradley MicroLogix 1400, #1766-L32BXBA (24 VDC) programmable logic controller;

b. One (1) Sierra Wireless RV50 Wireless Gateway (10/100/1000);

c. One (1) Phantom Multiband Omni-directional Antenna (N Female connector);

d. One (1) 3 ft. Wi-Fi Antenna Cable, LMR240;

e. Two (2) 24 VDC, 4.2 Amp power supplies;

f. Ten (10) of each size and type of 3AG fuse utilized in the RTU design.

E. EXECUTION

1. Installation

a. Final terminations of all signal and power wiring to the Main Control Panel (MCP) shall be performed by the Instrumentation and Control System Integrator. This includes both 120 VAC and 24 VDC signals. Hence the requirement for licensing as an electrical contractor.

2. Training

a. Prior to acceptance of the system, the Instrumentation and Control System Contractor shall provide two (2) 8-hour days of onsite training to cover operation of the new SCADA system.

b. Prior to acceptance of the system, the Instrumentation and Control System CONTRACTOR shall provide one (1) 8-hour day of onsite training to cover preventive maintenance and backup procedures for the new SCADA system.

c. Three (3) months after acceptance of the system, the Instrumentation and Control System CONTRACTOR shall provide two (2) 8-hour days of onsite training to cover operation of the new SCADA system.

3. Human-Machine Interface (HMI) Applications Development

a. All PLC programming and Human Machine Interface (HMI) graphics creation and HMI application configuration shall be performed by the Instrumentation and Control System CONTRACTOR. This programming shall include, but not be limited to, input/output (I/O) mapping, graphic screens, alarms, etc. The supervisory control and data acquisition (SCADA) system shall utilize an off-the-shelf, industry standard human-machine-interface (HMI) software product that includes support for process supervisory control, data acquisition, alarming, historical data collection and trending, and management report generation along with other third-party software products such as I/O servers, spreadsheets, databases, etc. to provide a complete and functioning monitoring and control system. The HMI applications software package shall be configured by the Instrumentation and Control System CONTRACTOR specifically for this system.

b. As a minimum, the following graphics shall be required:

1. One display screen for each Remote Site monitored by the SCADA System

2. Process Control Screen for each Process Subsystem, including control tuning screens if practical. Individual Control Pop-Ups for each pump, motor, or device requiring SCADA Control. Real Time Trend Screens for each process analog signal.

3. The Instrumentation and Control System CONTRACTOR shall be responsible for providing all programming and configuration services and ancillary equipment to accomplish the control and monitoring functions as described in the contract specifications and drawings. The System Integrator shall provide all programming functions including but not limited to control strategies and communications. All programming and configuration services necessary to produce the operator interface (graphic displays, trends, historical archive, etc.) as described in the contract specifications and drawings. Configuration shall include interfacing field devices and equipment provided under this subcontract with new Operators Workstations and PLC equipment.

4. The Instrumentation and Control System CONTRACTOR shall develop and provide all graphic screens for the systems provided. The graphics shall be designed and function with the Human Machine Interface (HMI) software. The exact number and type of customized process graphic screens shall be determined at the coordination meeting(s). The graphic displays to be developed shall represent the process equipment and instruments provided under this subcontract, as specified herein and as shown on the Drawings. Screen prints shall be submitted to the owner for approval.

c. Graphics Display Configuration

1. The System shall support multiple display types including lists, graphics, trends, etc. The Instrumentation and Control System CONTRACTOR shall provide detailed graphic display screens tailored to the specific installation and operational requirements.

2. The Instrumentation and Control System CONTRACTOR shall provide four (4) types of graphic displays for each process to provide the operations personnel with the proper interface to obtain the optimal information for monitoring and control of the facilities.

d. Display Types

1. 3D Photo Realistic Displays: The 3D Photo Realistic Displays shall be rendered 3D depictions of the real-world buildings and equipment to depict the equipment and its operational status. All views shall contain appropriate material representations (i.e., concrete, water, etc.) for the appropriate civil structures, backgrounds, and equipment. The ‘Realistic’ graphics shall focus on accurately representing a given area of the plant, and different processes physical proximity with other processes in the plant. Pump and pipe sizes are captured to give a realistic

perspective of the impact each device can have on the process. Whenever possible, all structures shall be dimensionally accurate, as indicated on the Contract Drawings. Detailed elements such as stairs, handrails, grating, etc. shall be included in the final rendered graphics. This view shall also enable operators to point out manual valves or other devices that are not tied into SCADA but may need to be adjusted from time to time.

2. 3D Process Displays: The 3D Process Displays shall be rendered 3D depictions of the various process loops. The purpose of these displays is to create an automated 3D P&ID to provide the operators the best information to control and optimize a process control loop. The 'Process' graphics shall focus on the process flow through the plant using piping and standardized symbols representing pumps, valves, and gates etc., all on plain off-white background. Relative size of these devices, along with pipes, and tanks shall be minimized or ignored, and flow arrows are overlaid onto each pipe in order to highlight flow throughout the plant's processes.

3. System Dashboard: The System Dashboard shall be a high-level summary of all process parameters, alarms and production summary. The graphic shall be logically arranged to quickly obtain an overview of all critical plant information.

4. Lean View: The Lean View Displays shall be visually appealing tables made up of summary information from the facility including operational process parameters, alarms, and production summary as well as derived statistical and anomaly data.

e. Graphic Display Creation

1. All full-screen graphics displays depicting operational parts of the system shall be fully rendered, 3-dimensional (3D) views.

2. No existing graphics shall be used for this project.

3. For future compatibility and transportability, 3-D renderings shall be created in 3D Studio Max.

4. Display presentation shall provide the following features:

i. All views shall contain appropriate material representations (i.e. concrete, water, etc.) for the appropriate civil structures, backgrounds, and equipment.

ii. Any bitmaps or graphics used to create the 3-D screens not included as a standard element of the modeling package shall be kept in a centralized common directory to facilitate easy distribution of the models if required.

iii. Whenever possible, all structures shall be dimensionally accurate, as indicated on Record Drawings. Detailed elements such as stairs, handrails, grating, etc., shall be included in the final rendered graphics.

iv. Equipment that is in an "OFF" or "CLOSED" state shall be represented as a solid non-animated colored object. "RUNNING", "ON", or "OPEN" conditions of the equipment shall be represented as striped with white and the desired operational color. In addition to the striped appearance, any operating piece of equipment shall be animated to depict operation, unless the piece of equipment consumes more than one-eighth (1/8) of the final screen size. This animation shall contain a minimum of five (5) separate images, cycled repeatedly to simulate motion and/or operation. If the graphic is larger than 1/8 of the screen size, a static image may be used, with the appropriate color for operational changes.

v. Animations utilized for the creation of additional graphic displays shall be rendered in the .AVI file format, with uncompressed frames. Smaller bitmaps, such as those used to

indicate multi-state animations, shall be cropped in such a way as to avoid duplicating areas of the screen which do not change from frame to frame. This is required to reduce the final file size of the HMI application, and to allow for smoother animation(s).

vi. Prior to commencement of system development by the SCADA System Integrator, a meeting shall be held at a location designated by the Owner to discuss details of the graphics design.

vii. All graphic displays which contain a device in alarm shall show its symbol flashing to allow immediate recognition of the problem by the operator.

viii. Bar graphs shall indicate the alarm limits and, if applicable, the setpoint for the value. The current value shall also be shown along with its data quality.

5. The Color Code for equipment status shall be the following:

   i. Red = ON, RUNNING, or OPEN;

   ii. Green = OFF, STOPPED, or CLOSED;

   iii. Yellow = ALARM, FAULT, TROUBLE, or FAILURE

6. Tabular Displays. All tabular displays shall be capable of being printed on the report printer. This shall normally be manually initiated, but provision shall be made for automatic printing periodically if desired. The following tabular displays shall be provided:

   i. Coordinate with Owner.

7. Alarm Summary. This display shall summarize all current alarms. The display shall be generated from stored data on disk, and shall consist of the point identification number, point name, time of occurrence, status (high, low, failure, normal, etc.), and time of return to normal if applicable. This and all other alarm tabular displays shall present alarms from the latest to the oldest ordered by:

   i. Unacknowledged critical alarms

   ii. Unacknowledged non-critical alarms

   iii. Acknowledged critical alarms

   iv. Acknowledged non-critical alarms

8. Current Alarm Summary. This display shall list all points currently in alarm. The display shall be generated on-line from stored data on disk and shall consist of all points currently in alarm with point identification number, point name, time of occurrence, and type of alarm.

9. Point Status Summary. This display shall show the status of all points in the system, including both real and calculated points. Information provided shall consist of the point Identification number, point name, and its current status (i.e., Running, Off, High, Low, Active, Disabled, ON-scan, OFF-scan, value, etc.).

10. Data Editing displays. Displays shall be provided through which the operator can interactively control the operation of the control system. Displays shall be provided which shall allow the operator to define the destination of a report or printout (e.g., Display, printer, computer file, etc.) and when it is to be printed (e.g., immediately, on demand, or automatically at a certain time).

11. Trend control. The operator shall be able to define additional trends of any variable in the system database (real-time trending) or in the historical database (historical trending) as follows:

    i. Trend displays shall present the operator with multiple options (e.g., with or without limits, time scale).

    ii. A cursor line or point shall be provided which can be moved along the curve to obtain exact readings at any point.

    iii. It shall be possible to overlay different trend curves to facilitate the comparison of related parameters.

    iv. It shall be possible to trend up to four different parameters on the same scale, each parameter being represented by a different color.

12. Reports. The final format of all reports shall be developed by the System Integrator, Design Engineers and Owner following Contract Award. All reports shall be capable of automatic and on-demand printing. All reports shall be archived for future use.

13. Operational Reports shall be provided for the plant. They shall show the start count and runtime of all equipment, and all analog process values such as level, pressure, and other analytical instruments. The following types of reports shall be provided with the system:

    i. Coordinate with Owner.

14. Daily reports shall show hourly values grouped according to some common trait. Chemical usage, flows, runtimes, etc. shall be displayed, with the maximum, minimum and average or total (as appropriate) for the day summarized at the bottom.

15. Monthly reports shall provide information in a similar format to the daily reports, and the monthly report data shall be derived from the same values used by the daily reports. The average or total shall be shown by date. Monthly reports shall accommodate for leap year and other date discrepancies. At the bottom of each column, the minimum, the maximum and the average or sum (as appropriate, pH is averaged, flow is totaled) for that column shall be calculated. The top of the report shall include Time, Date, Plant Location, Area identifier, Report title, etc.

F. I/O LISTINGS FOR REMOTE TELEMETRY UNITS

1. The following table lists the analog and digital input and output signals to be connected to each of the new remote telemetry units:

I/O Signal	Location / I/O Signal Description	
RTU-3	**Atomic Elevated Tank**	
DI-1 through DI-20	Spare DI Point – For Future Use; Not Wired	Spare
DO-1 through DO-12	Spare DO Points for Future Use; Not Wired. via Interposing Relay	Spare
AI-1	Analog Input - Wired to Kamikaze Analog Surge Protector	Atomic Elevated Tank Level
AI-2 through AI-4	Spare Analog Input Point for Future Use; Not Wired	Spare
AO-1	Spare Analog Output Point for Future Use; Not Wired	Spare
AO-2	Spare Analog Output Point for Future Use; Not Wired	Spare

RTU-4	Five Notch Elevated Tank	
DI-1 through DI-20	Spare DI Point – For Future Use; Not Wired	Spare
DO-1 through DO-12	Spare DO Points for Future Use; Not Wired. via Interposing Relay	Spare
AI-1	Analog Input - Wired to Kamikaze Analog Surge Protector	Five Notch Elevated Tank Level
AI-2 through AI-4	Spare Analog Input Point for Future Use; Not Wired	Spare
AO-1	Spare Analog Output Point for Future Use; Not Wired	Spare
AO-2	Spare Analog Output Point for Future Use; Not Wired	Spare
DI-1 through DI-20	Spare DI Point – For Future Use; Not Wired	Spare
RTU-5	**Sidereal Elevated Tank**	
DI-1 through DI-20	Spare DI Point – For Future Use; Not Wired	Spare
DO-1 through DO-12	Spare DO Points for Future Use; Not Wired. via Interposing Relay	Spare
AI-1	Analog Input - Wired to Kamikaze Analog Surge Protector	Sidereal Elevated Tank Level
AI-2 through AI-4	Spare Analog Input Point for Future Use; Not Wired	Spare
AO-1	Spare Analog Output Point for Future Use; Not Wired	Spare
AO-2	Spare Analog Output Point for Future Use; Not Wired	Spare
RTU-6	**Smithfield Elevated Tank**	
DI-1 through DI-20	Spare DI Point – For Future Use; Not Wired	Spare
DO-1 through DO-12	Spare DO Points for Future Use; Not Wired. via Interposing Relay	Spare
AI-1	Analog Input - Wired to Kamikaze Analog Surge Protector	Smithfield Elevated Tank Level
AI-2 through AI-4	Spare Analog Input Point for Future Use; Not Wired	Spare
AO-1	Spare Analog Output Point for Future Use; Not Wired	Spare
AO-2	Spare Analog Output Point for Future Use; Not Wired	Spare

G. WTP CONTROL LOGIC

1. Atomic Elevated Tank
    a. Monitor and/or indicate the following:
        1. Atomic Elevated Tank Level
    b. Provide for the following operator adjustable, password protected parameters:
        1. Atomic Elevated Tank low level alarm
            i. Initial set point: **12 feet**

2. Atomic Elevated Tank low low level alarm
    i. Initial set point: **10 feet**
3. Atomic Elevated Tank high alarm
    i. Initial set point: **28 feet**
4. Atomic Elevated Tank high high alarm
    i. Initial set point: **30 feet**

2. Five Notch Elevated Tank
    a. Monitor and/or indicate the following:
        1. Five Notch Elevated Tank Level
    b. Provide for the following operator adjustable, password protected parameters:
        1. Five Notch Elevated Tank low level alarm
            i. Initial set point: **30 feet**
        2. Five Notch Elevated Tank low low level alarm
            i. Initial set point: **28 feet**
        3. Five Notch Elevated Tank high alarm
            i. Initial set point: **39 feet**
        4. Five Notch Elevated Tank high high alarm
            i. Initial set point: **40 feet**
    c. **Note: This tank level is used to control the Clay Street Pump Station, which is still using the original DFS equipment. The contractor will be required to coordinate with the owner at the time of installed to insure continuous operation of that pump station. The contractor will also be required to provide any additional programming necessary to ensure operation of that pump station.**

3. Sidereal Elevated Tank
    a. Monitor and/or indicate the following:
        1. Sidereal Elevated Tank Level
    b. Provide for the following operator adjustable, password protected parameters:
        1. Sidereal Elevated Tank low level alarm
            i. Initial set point: **12 feet**
        2. Sidereal Elevated Tank low low level alarm
            i. Initial set point: **10 feet**
        3. Sidereal Elevated Tank high alarm
            i. Initial set point: **25 feet**
        4. Sidereal Elevated Tank high high alarm
            i. Initial set point: **28 feet**

4. Smithfield Elevated Tank

    a. Monitor and/or indicate the following:

        1. Smithfield Elevated Tank Level

    b. Provide for the following operator adjustable, password protected parameters:

        1. Smithfield Elevated Tank low level alarm

            i. Initial set point: **12 feet**

        2. Smithfield Elevated Tank low low level alarm

            i. Initial set point: **10 feet**

        3. Smithfield Elevated Tank high alarm

            i. Initial set point: **25 feet**

        4. Smithfield Elevated Tank high high alarm

            i. Initial set point: **28 feet**

H. VENDOR SELECTION AND ADMINISTRATION

1. Review and Evaluation Process

   The City will select a vendor on the basis of greatest benefits to the City of North Augusta, not necessarily on the basis of the lowest price. The vendor selected must have the necessary resources to provide for an effective and timely electrical maintenance service to the City of North Augusta. The vendor's references, capabilities, vendor commitment, and quality of proposal will be weighted heavily.

2. Acceptable Contractors / Manufacturers

    a. The SCADA system shall be furnished and installed under the supervision of a single Instrumentation and Control System Contractor who is regularly engaged in the design and installation of SCADA and instrumentation systems for the municipal water and wastewater industry.

    b. The Instrumentation and Control System Contractor is responsible for providing engineering, design, supply, delivery, installation, certification, calibrations, and adjustments, software configuration, testing, and start up, of a complete, coordinated control system warranted to perform the intended functions as herein specified.

    c. The Instrumentation and Control System Contractor shall include a letter from your Bonding Company indicating that they will provide a Performance and Payment Bond in the event that you are the successful bidder on this project.

    d. These specifications cover the intended function of the equipment, but do not necessarily cover all details necessary for a complete, operable, and functional system. The Instrumentation and Control System Contractor shall supply all devices and appurtenances necessary to provide a complete, operable, and satisfactory system as indicated or specified herein at no additional cost to the Owner.

    e. As required by the South Carolina Department of Labor, Licensing, and Regulation (SC LLR), the Instrumentation and Control System Contractor shall hold a valid and current Certificate of Authority to practice professional engineering in the State of South Carolina. A copy of this certificate must be submitted with the contractor's bid.

f. The Instrumentation and Control System Contractor shall hold a valid and current Electrical Contractors License in the State of South Carolina. The minimum Classification allowed for this project is EL4 ($200,000); however, EL5 (Unlimited) will be required if the project bid amount is over $200,000.

g. The Instrumentation and Control System Contractor shall be a certified member, in good standing, of the Control System Integrators Association (CSIA).

h. The Instrumentation and Control System Contractor shall hold a valid South Carolina Retail License.

i. The Instrumentation and Control System Contractor shall hold a valid City of North Augusta business license.

3. Contract Length

The City of North Augusta expects to enter into a contract with the selected vendor that will not exceed the 2020 fiscal year. The contract may be subject to the City's cancellation at any time with a 30-day written notice if the requirements of the contract are not being met by the vendor.

4. Price Quotations

Prices quoted by vendors should be firm prices, not subject to increases during the term of the contract.

5. Notification of Vendor Selection

All vendors who submit bids in response to this sealed bid request will be notified in writing of the result of the selection process.

6. Vendor Incurred Costs

All costs incurred in the preparation and presentation of this proposal in any way whatsoever shall be wholly absorbed by the vendor. All responses to the Request for Proposal shall become the property of the City of North Augusta unless requested otherwise by the vendor at the time of submission. Any material submitted by the vendor that is considered as confidential in nature must be clearly marked as such.

SCADA SYSTEM RTU IMPROVEMENTS (PROPOSAL)

We, the undersigned, hereby propose to provide SCADA System RTU Improvements for the City of North Augusta, in strict accordance with the specifications, at the following rates:

Description	Lump Sum Amount
RTU – 3 / Atomic Elevated Tank	
RTU – 4 / Five Notch Elevated Tank	
RTU – 5 / Sidereal Elevated Tank	
RTU – 6 / Smithfield Elevated Tank	
Total Bid Amount:	

SUBMITTED BY:

Company: _____

_____ _____

Authorized Signature Date

Address:

_____

_____

_____

Telephone #: _____

Email: _____