

Request for Proposals

Water Treatment Plant additional PLC and RTU Radios

Purpose

Wausau Water Works is seeking proposals for updating the PLC controls for the water treatment plant. Specifically, the utility would like to separate the distribution controls from the treatment plant controls either by adding a second PLC or replacing the existing PLC with this ability.

General Characteristics of the Water System

The current system uses an Allen Bradley PLC 5 (1994 vintage). This PLC controls the Water treatment plant and controls the wells and monitors the water booster stations, reservoirs and towers. The water supply is provided by six high capacity groundwater wells. Water is pumped using vertical turbine pumps. The well pump operations are controlled by the level of water in the clear well at the plant. Effluent pumps at the water plant provide treated water from the clear well to the distribution system. The effluent pumps are controlled by the water level in the 12th Avenue Reservoir.

The distribution system consists of approximately 220 miles of water main (sizes 6" through 14") consisting of cast iron, ductile iron, and HDPE pipe. Storage in the system consists of the Highland Drive Water Tank (1 Million Gal), Brown Street Tower (500,000 Gal), 12th Avenue Reservoir (2.5 Million Gal), West Wausau Avenue Tank (300,000 Gal), West Wausau Avenue Tower (250,000 Gal). There are 9 booster pump stations throughout the City. These booster pump stations have localized controls with the exception of the Brokaw booster, which is controlled directly by the PLC at the water plant.

Status of the supply and distribution system is done using WonderWare Software, this software is loaded on two separate PC's located at the water treatment plant. Viewable information is the reservoir/tower levels, booster station information, well/pump status, and alarms. All alarms are sent to an audible horn at the water plant and to an autodialer.

General Operation of the Water Treatment Plant

The water treatment plant is a lime softening plant. The water treatment plant receives its water from wells which is pumped using vertical turbine pumps. The water enters the plant through a Volatile Organic Compound (VOC) air stripper or general aerator. Lime, Alum Polymer and Activated Silica is then added to the water prior to entering the clarifiers. The Lime is added to raise the pH of the water which reduces hardness. The Alum Polymer and Activated Silica are used to assist with the removal of iron & manganese, and reduce Total Dissolved Solids. These precipitated materials are settled out in the clarifiers. The water then flows to the Recarbonation Basins where carbon dioxide is added to reduce

the pH to a more neutral level. The water leaves the Recarbonation Basins, Fluoride is added and then the water is filtered to remove any solids not settled in the clarifiers. Once filtered, Chloramines (ammonia & chlorine) are added for disinfection along with Sodium Silicate and the water is then sent to the clear well and ready to be pumped to the distribution system.

The lime control is influent flow paced with pH trim. All other chemicals are flow paced and feed chemicals in relation to well pumps in service. The clarifier speed is influent flow paced inverse control and clarifier sludge blow down is timer controlled.

Proposed Upgrades

The utility wants to reduce scan time in the current PLC at the plant and reduce the amount of memory used in the current PLC. The utility is looking for options to make this change in the plant operation. The Utility is requesting proposals for splitting the plant operation from the distribution system monitoring at remote sites (RTUs). Currently, all information runs through the master PLC and if it fails, control of all operations is down. This has resulted in flood damage at the plant. Wausau Water Works is open to other options to reach this goal.

In addition to the work proposed above Wausau Water Works would like the following materials and work included in the proposal:

1. A new level transmitter for the clear well. The level transmitter will have its own DC power supply, not shared. The analog output (4-20mA) from the level transmitter will be sent to the proposed new PLC. The new PLC shall be, or made compatible with current PLC and PC Wonderware software.
2. PLC shall be Allen Bradley
3. Level transmitter shall be Honeywell Smartmeter.
4. A new DC power supply for level transmitter.
5. A new RTU modem shall be provided.

Plant and RTU sites shall not exceed 6 hours down time per day.

Contractor will provide all material, labor and licensed software to complete the job

Work shall be completed within 60 days from the Notice to Proceed.

Add Alternates – priced separately

1. Proposal to replace all radios at RTUs with installation and testing. Includes 17 sites, a master radio and a repeater.
2. Proposal to add a cascade controller to the CO₂/ recarb in the North plant.
3. The utility prefers GE-MDS or Motorola radios.

Wausau Water Works is currently proposed to fully upgrade/expand the water treatment plant the next 5 -7 years. All work/equipment proposed under this RFP shall be able to be used with any proposed plant upgrades and expansions.

Proposal shall include a detailed description of work to be completed as well as materials required to complete the work. Proposal shall also include a detailed description of the proposed operation of the plant and distribution system once the upgrades are completed. Along with the description of operation Wausau Water Works shall be provided a complete Operation and Maintenance Manual complete with wiring diagrams and troubleshooting techniques for the installed equipment.

Proposals shall be reviewed based on the type of proposal, work to be performed, timeline established for completion of the work and the description of operation, not solely based on price.

QUALITY ASSURANCE

- A. The contractor shall assume the total, undivided responsibility for the correct operation of the control system.
- B. The completed electrical installation shall meet the requirements of the latest edition of the National Electric Code (NEC). The work specified shall be subject to inspection and approval by authorized representatives of the National Board of Fire Underwriters, State and local governing authorities and the owner.

SUBMITTALS

- A. Provide a detailed Bill of Materials along with descriptive literature identifying each component name, manufacturer, model number, and quantity supplied; including but not limited to:
 - 1. PLC
 - 2. Level transmitter
 - 3. RTU modem
 - 4. RTU radios

ACCEPTANCE

- A. Work shall not be accepted until testing connected with this work has been completed satisfactorily.
- B. Work found to be defective in performance shall be corrected to the satisfaction of Wausau Water Works.

WARRANTY

- A. Provide a one (1) year warranty for parts and labor from date of acceptance by the project engineer guaranteeing that the entire project and all equipment shall be free from defects in design, materials, and workmanship.

TRAINING

- A. The training program shall educate operators and maintenance personnel with the required level of system familiarity to provide a common working knowledge concerning all significant aspects of the system being supplied.
 - a. Once all equipment has been installed and programmed the supplier shall provide two full days of on-site training for Plant Operators.
 - b. 3-months after final acceptance of the work the supplier shall return and provide one additional day of training to Plant Operators. This training shall be scheduled prior to final payment being made by the City.
- B. The system supplier shall provide all instructional material, equipment, and manuals to conduct the training program.

OPERATION AND MAINTENANCE MANUALS

- A. Submit one (1) paper copy and one .pdf of the manual for review. Final copies shall include four bound paper copies and one .pdf.
- B. The system supplier shall provide complete sets O&M manuals.
- C. The system supplier shall provide electrical diagrams showing integration of all electrical and control components.

Wausau Water Works encourages all interested parties in quoting the work to make an appointment to preview the work.

Contact person:

Kevin A. Behnke cell 715-581-0494, phone 715-261-7287, FAX 715-261-0352

Kevin Behnke <Kevin.Behnke@ci.wausau.wi.us>

Proposals for the work are due no later than February 23, 2016 and will be opened by the Board of Public Works on February 24, 2016. Proposals shall be mailed to:

City of Wausau – Engineering Department

407 Grant St.

Wausau, WI 54403-4783

Award of work will be based on best value for Wausau Water Works and not solely determined by cost. Proposals will be rated based on proposed level of service, type of materials, proposed work schedule and cost.