

Winfield upgrades water treatment plant

The city of Winfield had an open house on August 18 to show the public the recent improvements to the city's water treatment plant. Approximately \$6 million was spent to upgrade the plant. These improvements were part of a comprehensive plan beginning in the year 2000 to upgrade the city's water supply system. The first part of the plan included approximately \$2 million in water line improvements to the city's distribution system. The city increased water rates a total of 30% in four, staged increases to pay for these improvements.

The plant improvements were the first since its construction in 1969. These improvements were necessary to comply with the disinfection byproducts regulations, to better eliminate taste and odor problems that frequently occurred, and to provide more efficient and reliable plant operations. The treatment plant capacity is 6 MGD. These improvements also benefit the city's wholesale customers which include Cowley Co. RWDs 2, 4, 5, 7, 8 and the city of Burden.

Construction at the plant started in January 2004 and was essentially complete by June 2005. Professional Engineering Consultants of Wichita were the engineers of the improvements and Walters Morgan Construction, Inc. of Manhattan was the general contractor. It was a real challenge during the construction to keep the plant in continuous operation while maintaining high treatment standards; but this was accomplished as a result of the close cooperation between the plant staff and the contractor.

To lower disinfection byproducts and to eliminate taste and odors in the drinking water, the city installed ozone treatment.

building above the two ozone contact basins which each have three chambers. The building is constructed with pre-stressed

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Two, 150 pound-per-day ozone generators produce the ozone onsite from pure oxygen. Liquid oxygen is stored onsite in a special outside storage facility. The generators and auxiliary equipment are housed in a new

concrete panels that form the walls and roof which were put up in one day.

Aluminum covers were installed on the two existing solids contact units. This was necessary to reduce algae and bacteria

growths on the walls and troughs because the first chlorination point was being moved to the filter effluent from the head of the plant.

New alum feeders, lime feeders, and feeding troughs were installed. The gravity, open chemical feed troughs eliminated the feeder line clogging problems associated with the previous pumping of



Winfield Water Superintendent Dan Defore answering questions during an open house tour in August.

Winfield upgrades water . . .

these chemicals. A new polymer feed system was also installed. A new two-stage rapid mix for these chemicals was constructed to provide efficient use of the chemicals.



Four new chlorinators with some new chlorination locations were installed. Also, a new ammonium sulfate feeding system was installed so that combined chlorine residuals are properly maintained in the distribution system of the city and its wholesale customers.

The city essentially installed new filters. All that is the same from the old filters is the building, filter walls, and some piping. The new rapid-sand filters include new

underdrains, media retaining caps, air scour system, 30 inches anthracite, 15 inches sand, filter controls and console.

Improvements included changing over the high service pumps to a 480-volt system from the previous 240-volt system. Now all transfer pumps and high service pumps are on a 480-volt system. Also,

distribution system, and in savings of electrical costs. All plant water line valves were replaced with new valves using K-Tork actuators.

A new, air conditioned room was constructed specifically for the all-new switching gear for the plant electrical system. Also, a permanent onsite switching gear was installed outside the building where either of Winfield's two 1.6 megawatt portable Caterpillar generators can be hooked-up within a few hours of an electrical



Above: Filters and control console

Right: Ozone generator uses electricity to change oxygen to ozone.

variable frequency drives (VFDs) were installed on all transfer and high service pumps. These changes result in better treatment, in less pressure fluctuations in the

power failure. The new portable generators are stored at different locations within the city and are trailer mounted.



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A new plant process control laboratory was installed including all new shelving, furniture, and analytical equipment. A SCADA system was installed to monitor and control the treatment

locations were installed at midway and the plant so that the “pigs” could be removed. The raw water line to the plant was then “pigged” in February of this year for the first time since the line was put

getting the “pig” stuck but all went well and the “pigging” was successful.

The water customers inside and outside of the city should be proud of the improvements at the plant. Water Superintendent Dan Defore and the five plant operators will now continue to provide an excellent drinking water which will now meet even higher water quality standards.

into operation over 30 years ago. Water Superintendent Defore was nervous about



Left: Ozonation building

Below: Solids contact unit cover

Below left: The 24-inch diameter “Pig” used to clean the raw water line to the plant.

Below right: Ammonia feed system



processes. A new, efficient boiler for plant heat was also installed.

The raw water supply for the treatment plant is Winfield City Lake which is located ten miles northeast of the city. Launching locations were installed in the raw water line at the lake and midway to the plant so that cleaning “pigs” could be launched. Also, retrieval

