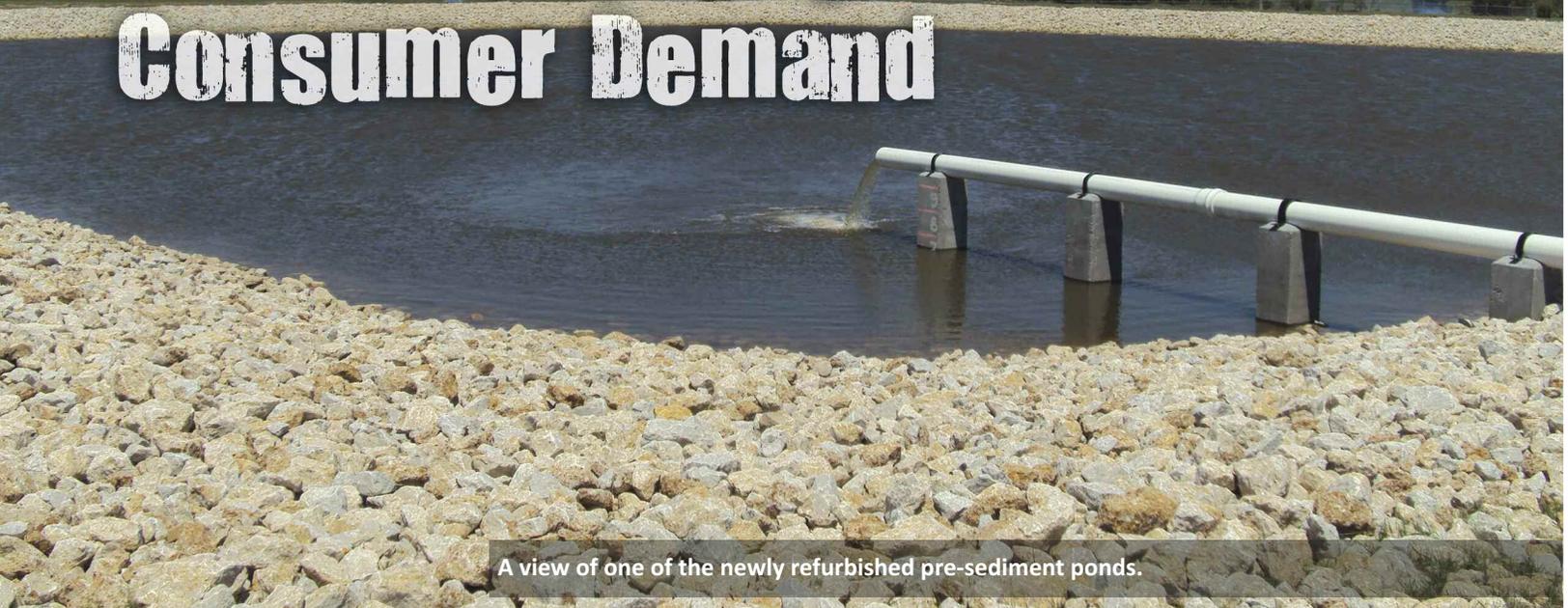


Public Wholesale District 5 Doubles Capacity To Meet Consumer Demand



A view of one of the newly refurbished pre-sediment ponds.

Public Wholesale Water Supply District No. 5 (PWWS D 5), located in Allen County northeast of Iola, Kansas, recently doubled its production capacity to meet demand. The improvements, which cost \$650,000, were paid by using district funds.

PWWS D 5 presently serves eleven entities. They include the city of Colony, the city of La Harpe, the city of Moran, the city of Walnut, Allen RWD 4, Allen RWD 16, Allen RWD 8, Neosho RWD 2, Bourbon Cons. RWD 2, Anderson RWD 5, and Allen RWD 6. In March 2013, the combined usage of the eleven entities was more than seventeen million gallons.

The district began producing water in September 1983. PWWS D 5 was the first wholesale plant in Kansas to produce water. When first going online, the district produced a mere 175,000 gallons per day. The raw water source is from the Neosho River. A subsequent improvement included two pre-sediment ponds; each has a capacity of four million gallons. Because of increased consumer demands, the district's board of directors recently voted to expand the water plant.

The project was engineered by Shane, Kline & Warren, Inc., of Iola. The water plant was originally equipped with three sand filters measuring seven feet by eleven feet. The expansion project added three additional



View of the front of the water plant



One of two 176,000-gallon clarifiers at the PWWSO 5 plant just north of Iola, KS.



Operator Larry Toney manually backwashes one of the new filters.

With all six filters online, the water plant is presently producing 830 gallons per minute. Maximum production can be increased to 1,400 gallons per minute.

filters of the same size. The new filters were constructed by Roberts Water Technologies, Inc., of Darby, Pennsylvania. Each of the six filters contain twelve inches of anthracite and eighteen inches of sand. With all six filters online, the water plant is presently producing 830 gallons per minute. Maximum production can be increased to 1,400 gallons per minute.

All the filters in the plant have a filter-to-waste option. This is an advantage because operators can operate filter-to-waste initially after placing the filters into operation immediately after backwashing. A new air scour was installed to assist with the backwashing process to help better remove trapped particles. Each

filter is metered individually to monitor the output, and to help determine when the backwash process should be done. The backwash process is manually controlled; the decision to backwash is determined by the head pressure of the filters. The backwash flow rate for each filter is 1540 gpm. The backwash rate

is 20 gpm/ft². The backwash time is five to ten minutes per filter. Each filter also has a Hach turbidimeter for continuous turbidity monitoring.

When backwashing the filter, the term “bed expansion” is sometimes used. This means the percentage of the original bed depth to which the bed is

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fluidized during backwash. The normal maximum is fifty percent.

The degree of expansion is a function of the backwash rate, the size, shape, and specific gravity of media, as well as the specific gravity and the temperature of the backwash liquid.

The plant has two 176,000-gallon clarifiers prior to the filters. Each of the clarifiers has a capacity to produce one million gallons per day. Polymer is fed at the rapid mix prior to the clarifiers to assist in the treatment process. Carbon is also fed at the head of the plant to eliminate taste and odor problems; chlorine dioxide is used to provide the disinfection process. Ammonia sulfate is fed after the filters to minimize disinfection byproducts. This also converts free chlorine to combined chlorine for providing a chlorine residual in the distribution system.

The plant also has one 106,000-gallon clearwell. It currently is equipped with three high-service pumps. Along with this underground storage, the district also has one 500,000-gallon standpipe and one

Along with this underground storage, the district also has one 500,000-gallon standpipe and one 350,000-gallon elevated tank. With the clearwell, the overall storage capacity is 956,000 gallons.

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The water rate from PWWSD 5 is as follows: City of Colony, \$1.71 per thousand; Neosho RWD 2, \$2.72 per thousand; all others are charged \$2.85 per thousand gallons.

Presently, PWWSD 5 has three operators; each holds a Class IV water operator certification. Elmer Tatsch, Manager, has been with the district for

31 years. Larry Toney has been with the district for nine years and Craig Cooper has been with them for five years.

In 2003, the district made the decision to purchase a 400 KW generator. This generator is large enough to power the entire plant in case of an emergency or power outage. The generator has an automatic startup on a monthly basis to ensure reliability in the event of an emergency.

PWWSD 5 has always planned for the future. They have implemented new technology and increased capacity to meet consumer demands. They are to be commended for all their efforts.

Tony Kimmi has worked as a Tech Assistance for KRWA since October 2009. He has extensive experience in the operation of construction equipment. He has assisted in the construction of several rechlorination stations and ongoing monitoring of water quality issues.



quality issues.

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