by Lonnie Boller

Carbondale comeback: water treatment plant under control

Over the past several months the city of Carbondale, Kansas, located south of Topeka, has been faced with many challenges involving the city's old, and until recently, poorly maintained water treatment plant. Kevin Richardson, Carbondale's new operator, had very little water system experience before taking the city water operator position in July of 2004. Since then Kevin has become one of the best small town operators around. Kevin was on board, helping with much of the rework, new equipment installation and cleanup on the plant since the middle of last year. He has also taken part in KRWA training whenever possible. He takes great pride in plant's appearance, water quality, and maintenance.

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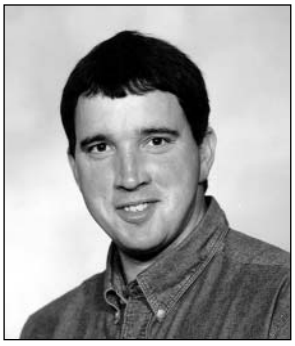

In the December 2004 issue of *The Kansas Lifeline* in my article, "Losing your operator: Challenge or crisis?" I described in detail the Carbondale water plant's poor condition. Photos accompanied the article, showing areas needing the most attention. I am now very pleased to describe and illustrate the many improvements presently in use at the Carbondale water plant.

The plant had substantial electrical problems and the wiring was next to impossible to trace. Because of malfunctions, the plant lost a rapid mix motor and numerous problems were encountered with the solids contact basin. The renovation included rewiring the entire water plant and installation of variable frequency drives for all four high service pumps.

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The renovations included installation of a new telemetry system with digital readouts to control the clearwell and water tower. The turbidity monitoring equipment and chlorine analyzers were interfaced into the telemetry control system. Automatic alarms are now in use that shut the plant down if the turbidity or chlorine goes beyond parameters.

Carbondale operator Kevin Richardson performs jar testing to adjust coagulant feedrates to attain the best possible finished water.

Although problems still exist with the filters, operators have added anthracite and painted the outside of the filters. A turbidity analyzer has also been installed at the top of the filters to help determine the quality of water coming from the solids contact basin. This will allow the water plant operators to better control the processes.

Many changes have been made to the carbon feeder system. A vent system has been installed as well as replacing belts and adding new flow control valves. Now with the turn of a knob, a taste and odor problem can easily be addressed.

The city team has made many changes to the solids contact basin. A gearbox and gears were replaced; new belts were installed. In the old set up, the operator did not have the capability to change the speed on the mixer unit. In the revamped system, the basin is presently operating properly with the operator able to control the sludge blanket for more efficient coagulation and

flocculation. The new system also has a sludge judge-measuring device so operators can take daily readings of the sludge blanket. Allowing more efficient operation. A new sludge blow off valve and control timer have been installed that allow a few minutes of sludge blow off per hour so an adequate blanket of sludge can be maintained.

In the original Carbondale system an additional solid contact basin had been sitting unused for some time. The plant was not meeting the new regulations for TTHM and HAA_5s. KRWA provided assistance to the city for re-piping this second unused contact basin so water would flow through it after flowing through the first solids basin. Kevin also plumbed a new line with a way to add chlorine to the second basin. The chlorine feed was discontinued in the first basin and chlorine is now fed at the second basin. This helps reduce the free chlorine contact time and also minimizes the production of byproducts because of not adding the free chlorine at the head of the plant. Organic materials are allowed to settle out in the first basin. This change will help the plant meet the new drinking water regulations.

The recordkeeping has improved dramatically with the help of a new computer and a trained operator. Kevin calculates the CT values weekly and does a great job with the paperwork for KDHE. He has learned that good documentation facilitates better process control changes.

Many of the plant's chemical feed pumps have been replaced with units sized according to the chemicals that need to be fed. These new pumps are easier to calibrate when the operator routinely checks the calibrations.

Most of the water lines at the plant have been primer coated, painted and color coded for easy identification as to function.

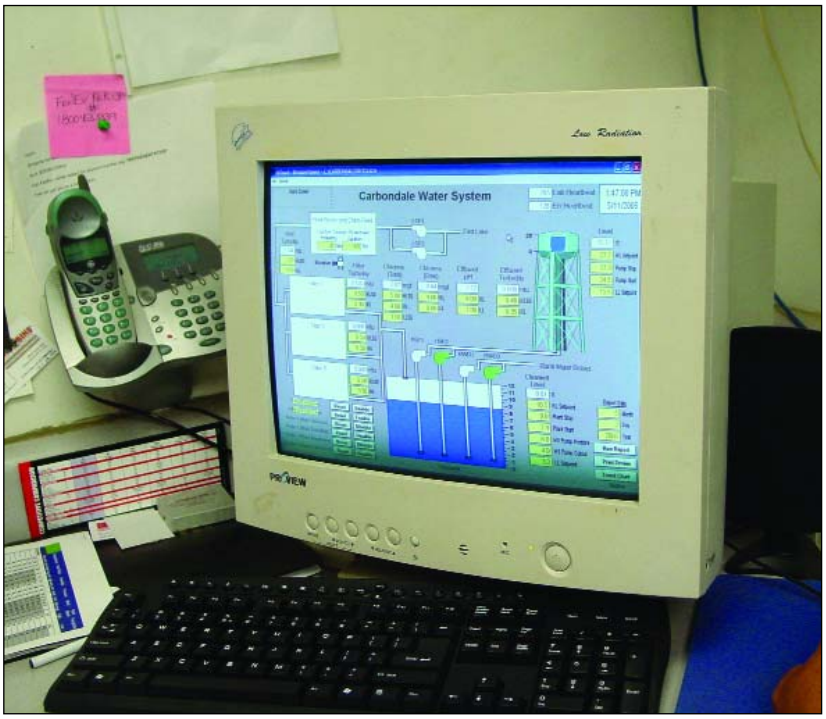
All Carbondale water plant repairs and upgraded functions wouldn't have been possible without hard work and persistence of operator Kevin Richardson, Mayor Joyce Green and support from the Carbondale City Council. The mayor worked with the city team putting in many long nights to ensure the plant was operating properly.

New electrical controls have been installed in Carbondale's treatment plant. The old controls were a source of many electrical problems.

The city is presently utilizing the services of Bartlett & West Engineers, Topeka, who are finalizing plans for the completion of additional upgrades such as filters and covers over the existing solids contact basin.

Carbondale's reinvigorated municipal water plant is a small town success story. KRWA is pleased to have assisted in the planning and execution of this major renovation. KRWA will be able to provide training and further technical assistance for plant operators and city elected officials.

The funding that allows KRWA to offer these services is provided through a contract administered by the Kansas Department of Health & Environment's Revolving Loan program, in effect, federal dollars put to use in the manner intended.



New SCADA system helps Carbondale monitor plant operations. Prior to this new system, Carbondale only had chart recorders.