



P.O. Box 226 • Seneca, KS 66538 • 785/336-3760
FAX 785/336-2751 • <http://www.krwa.net>

June 30, 2010

Dave Anderson
Rock Springs 4-H Center
1168 K-157 Highway
Junction City, KS 66441-7859

Dear Dave,

This letter is in follow-up to my on-site visit with you on June 22, 2010, to the Center to review wastewater operations. The Kansas Department of Health and Environment (KDHE) requested an on-site visit to provide any technical assistance that may help in complying with the E-coli permit limits.

During this visit, there appeared to be a high flow to the plant as all sand filters contained a level of water on the surface. Under normal operating conditions, each cycle event from the dosing siphon would deposit water to the filters one at a time, alternating from filter to filter. Normally the filter surface would not have a water level when it was time for the next cycle. As you stated, this condition is not normal, as flows in the system have increased due to recent heavy rainfall events. This higher than normal flow will likely cause problems in the chlorine contact chamber as it decreases the chlorine contact time. The E-coli failures at your plant however, have occurred over the last several months, at times when the flow to the plant would be more normal.

The challenge here was to determine why this plant suddenly, about 12 months ago, began violating the E-coli permit limit when there has been no change in treatment process. The only change that did take place was replacement of the pumps at the main pump station about one year ago. The old piston pumps were replaced with submersible pumps and the gpm delivery rate increased. You stated that you have been in contact with Mike Younger with JCI (pump supplier) and have been considering installing variable-frequency-drives (VFDs) on the pumps to reduce the flow rate to the plant.

I contacted Mike later to discuss this and he estimated that the piston pumps probably delivered about 15 to 20 gpm and the new pumps will deliver 90 gpm. Even though the daily flow to the plant may not have increased, there would be a significant change in the way the plant received the flow. Rather than having pumps run for long periods of time delivering low flow, you now have shorter pump run times with a higher flow rate through the plant. The result is that there will be times when the contact time in the chlorine basin will be shorter than previously.

Mike stated that by installing VFDs on the pumps, the pump rate would be reduced about 50%, or to about 45 gpm. Even though 45 gpm is still higher than the old pumps; this would bring the flow closer to the original rate. By making this change, the flow rate to the plant would be reduced. This could help overall performance at all units at the plant. It should improve solids settling at the Imhoff Tank, allow more uniform distribution of water to the sand filters, and help to equalize the flow through the chlorine contact chamber.

Other options would be to make physical changes at the plant. The chlorine contact basin could be extended to add contact time or another form of disinfection could be provided. The most common type of wastewater effluent disinfection is ultraviolet (UV) light. Adding UV disinfection would be very costly at your location and you would probably want to avoid that if possible. I would suggest that you consider adding the VFDs at the pumps as the first alternative. If that does not improve the E-coli numbers, then maybe consider adding contact time to the basin.

Funding for the above assistance was provided through a contractual arrangement between the Kansas Department of Health and Environment (State Revolving Loan Program set-aside) and the Kansas Rural Water Association (KRWA). Please call the KRWA if we can be of further assistance. Also, visit the KRWA website www.krwa.net for news and information concerning water utilities, training opportunities, and other KRWA programs.

Sincerely,

Delbert C. Zerr
Consultant

C: Shelly Shores-Miller, KDHE, Topeka
Marsha Carpenter, KDHE, Salina