

# Cross Connections Between Potable Water and Sanitary Sewers Need To Be Reported Immediately

In 2010, I provided assistance to an east-central Kansas community concerning improvements to their wastewater collection system. In January 2011, I stopped in again as a follow-up. I was immediately informed there was an issue with a cross connection between a potable water line and a sewer force main. Force mains are pipelines that convey wastewater under pressure from the discharge side of a pump to convey wastewater from a lower to higher elevation. I think explaining this issue may be of help to others: 1) how the problem was resolved; and 2) how it might have more efficiently been resolved.

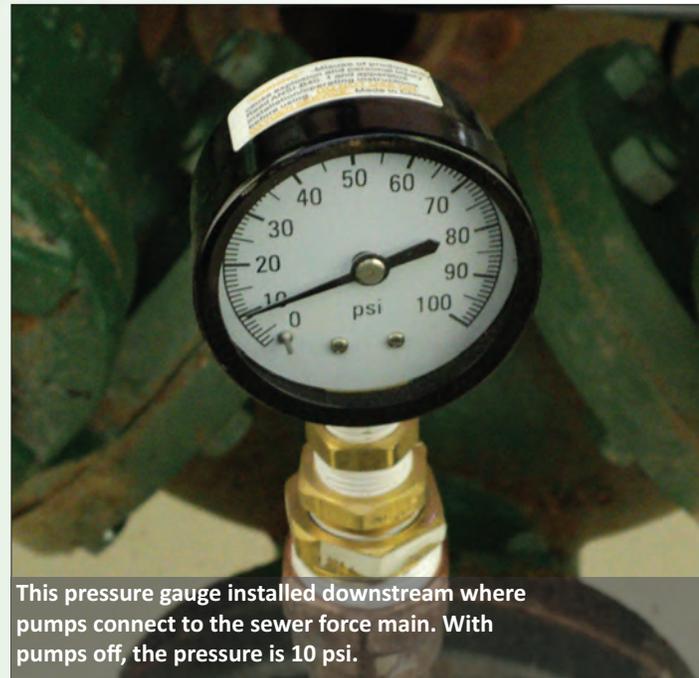
There is a mobile home park on the southwest corner of the community. The owner wanted individual water meters installed, instead of one meter for the entire park. Sometime in June or July 2010 a 2-inch water line was installed with a connection to an 8-inch water main to the west of the trailer court. Another connection was made to what was thought to be a 4-inch water main to create a loop at the trailer court. The 4-inch main however, was a force main located approximately three feet from the city's water line. The separation of the water and wastewater main does not meet minimum standards. At the time, the assumption was that the connection was made to a water main and not a sewer line. Both are the same size and material in this case. The valves for the waterline were not turned on until August 24, 2010.

Subsequent to opening the valves on this loop, the city noted high unaccounted for water loss. The city crews searched for leaks. On

November 3 the inspector for the sewer project was checking a manhole and found flow to be "pipe full"; he notified city staff. A chlorine residual test was taken; the water in the manhole had a residual of about 3.5 mg/l total chlorine. It was assumed this flow represented the loss that the crews had been searching for. It was thought that when installing the waterline to create the looped system, the sewer force main could have been hit and a leaking water line was then flowing into this sewer force main. As the line was being excavated, the sound of running water could be heard

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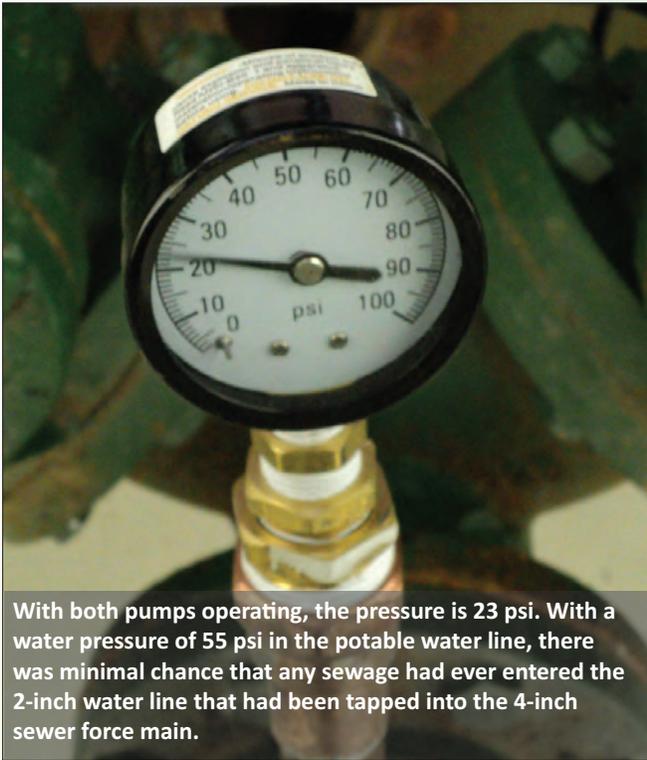
— yet there were no signs of leakage. Shutting off the waterline valves to the trailer court resulted in no flow in the manhole. At that time, the city should have notified KDHE that there had been a direct cross connection between the potable water system and the sewer system. It got late that day so the valves were left off and the waterline was tapped onto the water main using new fittings the next day, November 4.



This pressure gauge installed downstream where pumps connect to the sewer force main. With pumps off, the pressure is 10 psi.

The operator had told the superintendent that he thought KDHE should be notified immediately and the superintendent did not agree and so neither KDHE, nor the city council, were notified. If there is ever any question or thought about contacting KDHE about a problem, the correct action is simple: CALL THEM IMMEDIATELY! Any operator, city personnel or citizen for that matter, can contact KDHE at any time with concerns or questions.

During my stop at the city in January, I advised that we should get some basic information such as pressures on both the water line and force sewer line before calling KDHE. Looking back, it would have been advisable to report to KDHE and ask if the agency had other suggestions. The city staff tapped the force main to



With both pumps operating, the pressure is 23 psi. With a water pressure of 55 psi in the potable water line, there was minimal chance that any sewage had ever entered the 2-inch water line that had been tapped into the 4-inch sewer force main.

install a pressure gauge in the dry well of the lift station; pressure readings were obtained there and on the water main. The water line carried fifty-five pounds of pressure; there had been no leaks or loss of pressure in the area of the cross connection during the period from August to January. A water storage tank is located within three blocks of the area. There was twenty-three pounds of pressure in the sewer force main with both pumps operating.

Once we had the information the operator and I called the district KDHE office. We explained the situation and what we had done. The district office then contacted the central office in Topeka and within a half hour, it was determined that bacteriological samples would need to be collected and perhaps even to issue a “boil water advisory”.

KDHE personnel from the district office and Topeka arrived later in the day. It was determined that BACTI samples in the area would be taken. KDHE advised that a “boil water advisory” was not needed due to the time frame involved. They also requested a written report which the operator provided. The operator mentioned that KDHE appreciated

having the pressure readings and chlorine residuals available. The city did not receive a fine for failure to notify KDHE about the cross connection.

The operator who originally had suggested contacting KDHE is now the Acting Superintendent. He has initiated a policy that whenever a water tap is made, a chlorine residual will be taken by the operators prior to connections of

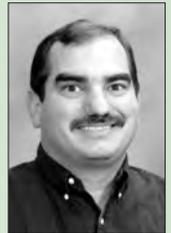
services; photos will also be taken. I believe this is a sound policy that will significantly reduce chances of cross connections.

As part of the city’s collection system upgrades, a new lift station will

be installed at another location to replace the existing lift station and a new force main will be installed further from the potable water mains. An identifier should also be installed with the new force main to reduce chances of connecting a water line to a sanitary sewer line.

Concerning the water loss, it was determined that water had flowed into the collection system for seventy-one days (August 24 to November 3). A 2-inch pipeline, 400 feet in length at 55 PSI will flow approximately 137,520 gallons per day or about 9,764,000 gallons over that period of time. The city will note this on their annual Water Use Report to advise the Kansas Dept. of Agriculture’s Division of Water Resources that the problem was identified and corrected.

*Charlie Schwindamann has been Wastewater Tech at KRWA since September 1999. Charlie holds Class II Water and Class I Wastewater Operator certification. He is a member of the Marysville, KS City Council.*



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