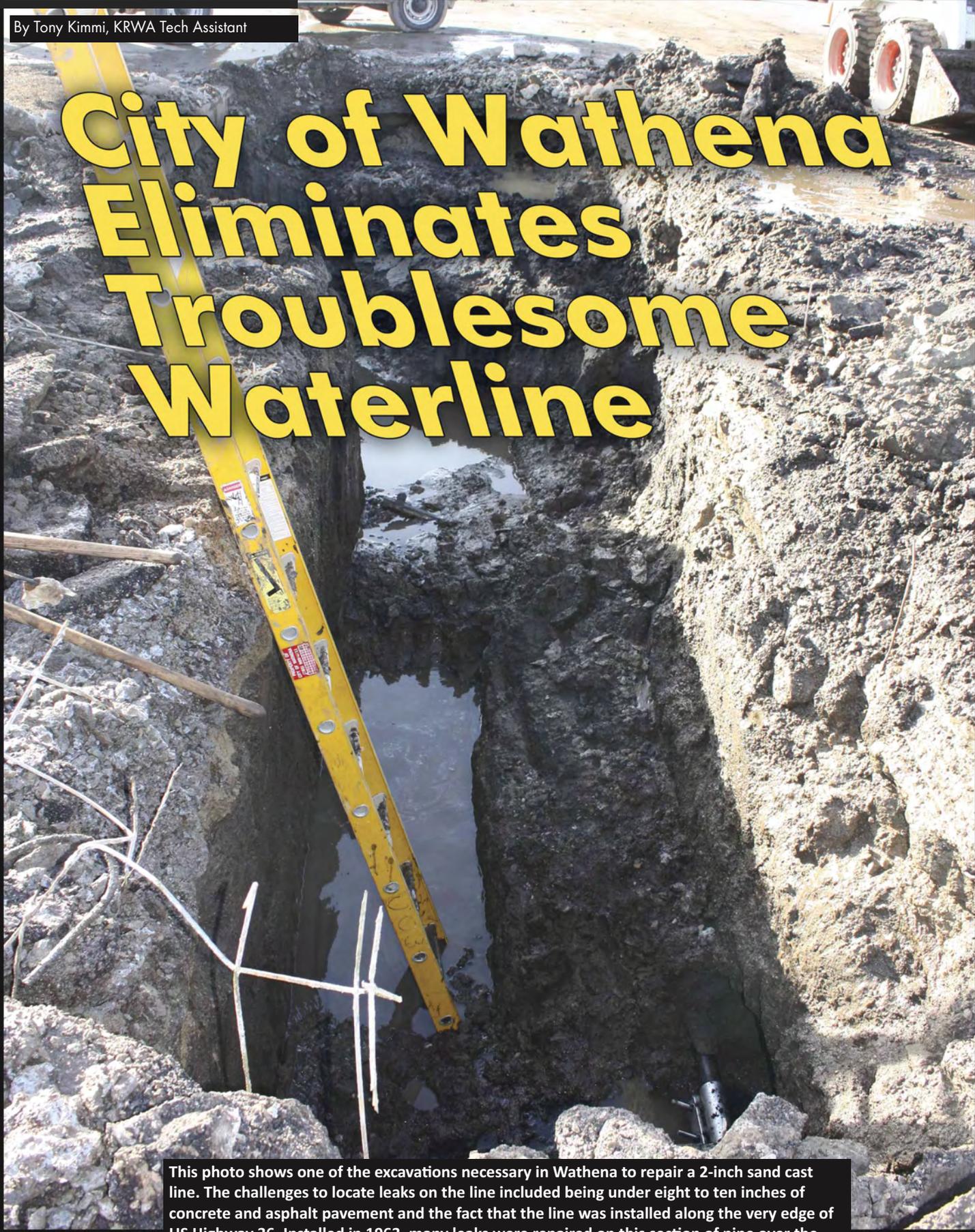


City of Wathena Eliminates Troublesome Waterline



This photo shows one of the excavations necessary in Wathena to repair a 2-inch sand cast line. The challenges to locate leaks on the line included being under eight to ten inches of concrete and asphalt pavement and the fact that the line was installed along the very edge of US Highway 36. Installed in 1963, many leaks were repaired on this section of pipe over the years. The city recently completed the replacement of the line with new PVC and further away from the highway, eliminating a major contributor to the city's high water loss.

The city of Wathena, located in Doniphan County in the far northeast portion of Kansas, has been plagued by significant water loss for many years. The city has a population of approximately 1,300 people and 560 service meters. The unaccounted for water has been as much as 50 percent.

The city currently purchases water from Missouri American Water at St. Joseph, Missouri. The connection to Missouri American was made in 1975. From 1975 to 1993, the city produced water through its own plant during the day, and used water from Missouri American at night. After the flood of 1993, the city's water plant was permanently abandoned.

My personal experience with Wathena's water loss began approximately four years ago. I was contacted by the city to assist in reducing the water loss. We first started by testing the master meter. The meter tested within the accuracy limits required by AWWA standards. We then conducted a water loss survey. After about three hours of "listening" to meters, we came upon a group of meters indicating a possible leak. All of these meters were connected to a two-inch sand cast main. The main was installed parallel to and under US Highway 36. With no water surfacing, city crew members and I decided to open sewer manholes to inspect for water entering the sewer system. There was a large amount of water flow in the system at the second manhole. With only seven customers on that segment of the collection system, we knew there was a large leak entering the sanitary sewer.

Next we used a subsurface leak detector to ground-mic over the water line. This procedure was very difficult due to heavy flow of traffic on US 36. The leak detection is so sensitive that a car can be heard from several blocks away. The work also proved to be somewhat dangerous because of the high traffic levels. Barricades and cones were set up to help ensure safety.

Working with the city, KRWA has found and the city made repairs to

numerous leaks on this segment of line. Most of the leaks on this line have been circle breaks. This is where the pipe breaks in almost a perfect circle. I believe the breaks were the result of traffic pressure and roadway vibration on US 36.

The city estimates that each of the water leaks on this line cost the city approximately \$4,000 to repair.

The city estimates that each of the water leaks on this line cost the city approximately \$4,000 to repair. Every time there needed to be an excavation, the fill had to be made to the specifications of the Kansas Department of Transportation. On one particular leak, the highway was opened, the leak was fixed, and the hole was backfilled. As soon as the hole was filled, water started surfacing again. The line was re-dug, and found a break

just 16 inches from the original leak.

With the encouragement from KRWA, the city council voted unanimously to replace the waterline with a replacement that is not under the highway. Three city blocks of line were replaced. This involved two blocks of 4-inch and one block of 2-inch PVC. The new waterline was placed north of US 36 in the city right-of-way.

The waterline upgrade also included a new 4-inch valve which replaced an existing valve that had not been operable for 20 years. A new fire hydrant was also installed. The next closest hydrant was two blocks away. A new flush hydrant was installed at the end of the 2-inch line. The line was looped into an existing 4-inch line for future expansion.

Each of the 11 customers on the new line also has a new meter pit, meter setter, and a new radio read meter. The city's water meters were previously installed in the basements of most of these customers' homes.

The project was awarded to M-Conn of Wathena, Kan. The total cost was approximately \$64,000. The boring cost was more expensive due to a new high pressure gas line that was in the area.

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The new shut off valve was installed away from 36 Highway for safety reasons. There were no shut off valves on the old cast pipeline so every leak had to be fixed live. That pipeline was installed in 1963; no one recalls why there was no shut off valve installed.

The project was started in May 2015 and was completed at the end of June. The abundance of precipitation this year played a factor in the time of the project.

The city operator has been quoted to refer to the old line as “The beast under 36 Highway”. And as luck would have it, just a few days prior to the new line being activated, the old sand cast line sprang another leak.

Since the project has been completed, the city’s water loss has been reduced by 800,000 gallons per month. At a rate of \$2.50 per thousand, the city will save a significant amount of money thanks to eliminating this troublesome line.

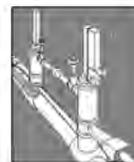
The city has also replaced all the service meters with radio read meters. City Clerk Jim Richardson reports that the city’s water loss is still at 30 percent, but it much better than it was. Yes, there's still work to do in Wathena – like in many other communities and rural water districts across Kansas.

Funding for the assistance by KRWA to Wathena was largely provided through the contract for onsite assistance that KRWA operates and which is administered by the Kansas Water Office. The funding for the program originates from the Clean Drinking Water Fee. That Kansas Water Office contract focuses on reduction of water loss. Cities and water districts and other systems are encouraged to contact KRWA for help on water loss or any other operation or maintenance issue for their water or wastewater system. No one has a magic wand to wave the problems away, but like at Wathena, working together, a difference can be made.

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. Tony enjoys providing assistance to public water systems.



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