Kansas Raw Water Main Condition Assessment and Cleaning

December 4, 2017



Location: DeSoto, KS

Client: City of DeSoto

Carylon Operating Company: Ace Pipeline Cleaning

Services Performed: Water Main Inspection & Leak Detection

Asset management sometimes requires a change in operation and maintenance instead of a pipeline rehabilitation approach. That was certainly the case for the City of De Soto, Kansas and their 3000 feet, 16-inch ductile iron raw water transmission main that crossed under the Kansas River from a well field north of the Kansas River. The transmission main was experiencing an alarming rise in pressure. The City owns and maintains this critical water main asset that transfers raw water from three ground water wells located north of the Kansas River to the south transmission main that carries water to the City's water treatment plant.It was estimated that it had been in continuous operation since the pipeline construction in 1960. Two of the original six wells on the north side of the River had been abandoned and were no longer in service.

The well field provides more than half of the City's water. Therefore, this main represents an asset considered to be one of the City's highest priorities due to its age and function. In addition, there was no construction information available regarding the pipeline construction under the River as it pre-dated the current well field.

The observed pressure change of 70 psi between that portion of the main north of the river and the downstream portion on the south side indicated a significant problem within the pipeline itself. The condition under the river was unknown.It was thought the cause could possibly be from a partial collapse of the buried pipeline, or leakage under the river, or significant blockages.

To investigate the problem, the City contracted with Ace Pipe Cleaning, Inc. to perform a direct insertion, live main, CCTV and leak detection inspection performed of the portion of the raw water supply line that is under the Kansas River, including land portions that approach the river on both sides. The City requested these inspection services in order to assess the overall condition of the pipeline and determine its existing structural integrity and hydraulic reliability of this 55-year-old asset.Ace Pipe Cleaning initially attempted the inspection in September of 2016.That is when it was learned that the build-up of the sediment in the pipeline had made such an inspection impossible. A condition assessment project had to become a pipeline cleaning project.An approach had to be developed to clean out the raw water main under the Kansas River and allow for the inspection.

To clean the raw water main Ace Pipe Cleaning initially used a specialized 120 psi water jetter truck with a warthog-type nozzle to cut and spray out the sediments that had solidified in the raw water main.There were some challenges with the cleaning, specifically accessing the pipeline under the river and providing high pressure water for the jetter nozzle in the middle of a corn field.There was also a very limited period of time that the raw water main could be taken out of service for the cleaning work. The operation had to coordinated very closely with the City to make sure they did not run out of water.The City could reserve about five days' worth of water supply.Ace Pipe Cleaning had to work within a very short window of time to drain the pipeline and do the cleaning work.

The initial attempts at line cleaning were successful to a point. In fact, over 1700 feet of main was successfully cleaned. The 120 psi jetter was good at cleaning the flatter sections of the transmission main that ran up to the River. However, once the jetter hosed reached the steeper approach to the River continued advancement of the jetter hose stopped. A different method of cleaning the line under the River had to be developed. To complete the cleaning under the river, a larger, 190 psi capacity jetter truck with a penetrator-type nozzle was used to traverse under the River and remove buildup in the transmission main.In addition, the source of the water for the jetting operation was taken from the River itself, eliminating the need for trucking water to the site.

The assessment of the pipeline at each point where the pipe had to be cut into and accessed revealed that the pipeline condition itself was in excellent condition and several decades of useful service life remain with this asset.A new maintenance plan of periodic cleaning will provide continued and uninterrupted service for years to come in the City of De Soto.