

Ruston Embraces Single-Source Solution

The city of Ruston, Louisiana, embraces single-source approach and builds an improved, high efficiency sewer system with the aid of Gorman-Rupp pumps.

Ruston, Louisiana, a city that boasts a population of just over 20,000 as well as home to famed Louisiana Tech University, is located in north central Louisiana along Interstate 20 between Monroe and Shreveport, and was founded in 1874. Rich in both heritage and tradition, the city puts a great deal of emphasis on protecting the residents and students that live there. Handling the city's sewage is just one example of that dedication.

As a result of steady growth and infrastructure expansion throughout prior decades, the city's wastewater was being collected, pumped and treated through an aging infrastructure, presenting excess stress – not only on the system itself, but on the staff now managing growth. Therefore, in a move by Ruston's mayor, Dan Hollingsworth, and council members, beginning in 1999 the city embarked upon a plan to look closely at the operation, to better understand the severity of the situation involving the city's 136 miles of collection system, 37 lift stations comprised of a combination of suction lift pumps, submersibles and wet pit/dry pit lift stations – all of which were built and installed with equipment by varying manufacturers – and 25 year-old treatment plant. Together, the Department of Water Utilities and the mayor's administration forged ahead to finalize an intelligent, 15-year plan to turn the city's sewage management and sewer system around – building a system that would maximize not only efficiency but productivity in the long-term.

Three Big Steps to Success

As the city soon realized, working to address sewer problems of this magnitude would prove to be an extensive process. City staff teamed with the local engineering firm Riley Company of Louisiana, Inc., and forecasted a three-step process. First, address the immediate need of critical delivery issues that Ruston was experiencing – improve the transmission system so that flow could be delivered directly to the city's treatment plant instead of overflowing to the environment. The second step involved building a new treatment plant as a reliable destination to process the wastewater once the lift stations were up and running. Third, and most lengthy,

evaluate and improve the 136 miles of 100-plus year-old collection system.

Too Close for Comfort

City operations personnel and Riley Co. personnel assessed each of the 37 sewer lift stations to determine which stations sufficiently met the city's needs, which pumps needed an upgrade, and which needed to be replaced or rebuilt completely. A primary objective of the long-term plan was the consideration of a "single-source" manufacturing partner, where possible, to minimize paperwork, operations and repairs, thereby maximizing administrative and pump maintenance efficiencies, too. Delta Process, the distributor that consulted with the city on equipment for the operation, and its representative, Ben Humphries, were able to provide valuable assistance in evaluating the serviceability of many of the existing pumping installations, as well as offering suggestions for possible repairs, replacements and upgrades to the existing installations to allow for future service.

Upon closer investigation, the city quickly uncovered the challenges associated with the aging pumps. Many were worn due to age – and others literally held together with "duct tape and baling wire." In other situations, dry pit pumps were completely submerged under 6 feet of water, whereby city workers were forced to access the dry pit to reach the pump's submerged disconnects. In fact, city records unveiled that in previous years, the Louisiana Department of Environmental Quality had issued administrative and compliance orders to the city for overflows at various locations throughout the city. "The investigation clearly indicated that the city had sewer problems that needed to be quickly addressed. We were committed to doing whatever it would take to fix the problems permanently," shares Mayor Hollingsworth. In the end, Gorman-Rupp was selected as the preferred technology because of its reputation and ability to meet our needs, explains Richard R. Aillet, P.E., director of the Ruston Department of Water Utilities.

The recently introduced Gorman-Rupp Ultra-V technology offered the city an immediate opportunity to increase the capacity of overloaded lift stations in certain locations. In fact, the city was able to simply rebuild one of the existing lift stations by converting the technology from a submersible station to a self-priming lift station. In other locations, the ability of Gorman-Rupp submersible pumps to run in a dry environment, offered the city the opportunity to place the pump in dry pit locations – due to the technology's cooling capability. Consequently, if the pit were to flood, the pumping technology will remain strong and operationally undamaged, even when submerged. Further, due to the city's rather hilly terrain, gravity collection lines were installed at certain points — allowing Aillet and his team to increase the service area of certain installations and remove several lift stations



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altogether, a feat that was also attributed to the Ultra V's innovative design capabilities.

"Our goal to move to single-source solution was secondary to our need to secure the right pump for the specific task at hand," recalls Aillet. "However, Gorman-Rupp supplied a pump for every individual situation that we needed to put out for competitive bids, and they operate in near perfect form."

Aillet and his team of engineers quickly realized that due to the vast and complex nature of the engagement, each of Gorman-Rupp's possible configurations had been enlisted. With this level of customization, the city of Ruston was able to totally rehabilitate the sewer system, bringing each lift station to maximum operational efficiency.

In the last eight years, the city of Ruston has invested a staggering \$3.5 million on upgrades and reconstruction to eliminate insufficient lift station technology. At the time, many of

the pump configurations were found with just one functional pump remaining, and others with manual and totally inoperable controls, bringing inefficiency to an all-time high.

Digging In to Get It All Done

Addressing the issues associated with rehabilitation of the aging collection system proved to be equally as challenging. As part of the evaluation process, the Ruston Department of Water Utilities collaborated with local engineering firms on a solution to the city's problem. In the end, the plan called for rehabilitation of seven major collection basins in all – one basin each year, for seven years. Currently in the initial stages of evaluating the first of the seven basins, the city has contracted with Pipeline Analysis, Inc., Dallas, Texas, to conduct an exhaustive evaluation of manholes, smoke testing and CCTV inspections of each basin. Whatever problems are found will be fixed – either in-house or with a qualified contractor.

In all, there are 136 miles of gravity sewer line and over 3,800 sewer manholes. "The gravity system infrastructure is one that when you look at the fact that it's 60 and 70 years old (and in a few cases over 100 years old), you just hope that you can get to them before they start collapsing, crushing and falling in," shares Aillet. "Trying to address each of these at one time quickly proved to be an infeasible effort," adds Aillet. So a seven-year analysis plan was crafted, whereby the city of Ruston began to plan to alternately and systematically review the worst case scenario first, followed by the next worse case, and so on. "Each year, a new scenario

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will need to be reviewed and considered. It's critical that the engineering expertise of a trusted partner becomes a big part of that ongoing assessment," added Aillet.

A Dream Team Success Story

In the end, improvements and reparations to the existing sewer system allowed the city to significantly decrease the overall number of required lift stations. Reducing the required number from 37 to 30 had a deep and long-lasting impact on the city's bottom line. "Obviously, the flow of wastewater had not decreased, but the city was able to install larger stations that were more efficient – and less in numbers," shares Humphries. "Further, by installing gravity mains and rerouting some force mains, we were able to take one set of pumps that had been moving sewage downstream from three different stations and redirect the flow altogether to carry the wastewater straight to the treatment plant. That single change left room in the original basin, and the city was then able to enjoy additional growth capacity from a lift station that had been there for 30 years."

Prior to the plan commencing, it was predicted that a 1/4-inch rainfall could create a situation whereby eight to 10 station overflows would likely occur. "After just three or four years into the improvement plan, when it rained 3/4-inch, 1 inch, or even 2 inch rainfall, instead of having eight to 10 overflow places, there were zero," boasts Aillet.

According to the city, Ruston's sewer treatment plant is two full years ahead of schedule. On December 28, 2008, wastewater was directed through the nearly completed North Treatment Plant for the first time. The number of compliance and administrative orders has also significantly decreased from 18 in 2000 to zero in 2007, and while the taxpayer rate on sewage did rise due to the improvements made, the residents of Ruston understand that something needed to be done. The residents can also find consolation in the fact that their sewer rates were lower in comparison to other area cities.

Prior to the implementation of the plan, Ruston homes were frequently experiencing sewage backup due to high water. That situation no longer occurs.

"This process is one that every community in the nation faces," adds Humphries. "Ruston, just like everyone else, has 60- to 80-years-old clay gravity lines that go under highways, buildings and houses. We knew that once the treatment plant and lift stations were resolved, we would be better able to uncover the best approach to fixing the source of all of the problems, but the question was which to fix first, the gravity collection system leaks or lift stations."

The plant improvements began immediately after the lift station improvements, and it has now increased from a 4-mgd wastewater plant to a 6-mgd, completely up-to-date plant. "The mayor and I worked very hard to make sure the Department of Environmental Quality understood what we were trying to do, and building that trusting relationship," adds Aillet. "Often, the regulatory agencies see mayors change hands every four years, and they hear the same statement of 'we know we have a problem, and we're going to fix it.' This mayor has allowed us to demonstrate that Ruston knew there was a problem and that Ruston was committed to fixing it. And we did." ■

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