

# Remote Monitoring Saves Money, Time for Rural Municipality

By Randi Minetor

Many small municipalities rely on nearby big cities for their wastewater treatment. However, these towns and counties — which often are wide in square miles but narrow in population — are responsible for monitoring their own flow to find localized problems in wastewater volumes, correcting them before they lead to excess flows.

The Newtown Bucks County Joint Municipal Authority (NBCJMA) takes this responsibility seriously, monitoring flow volumes in nine remote locations throughout this predominantly suburban and rural area of Pennsylvania. Just north of Philadelphia and wedged between Reading, Allentown and Trenton, PA, this municipality handles the wastewater for 8,500 customers by maintaining four wastewater pumping stations, nine metering sites, more than 50 easements and 98 miles of sanitary sewers in Newtown Township and Newtown Borough. NBCJMA performs routine and problem-specific maintenance for this wide area with only three field staff members. When a major problem emerges, the entire maintenance staff can be tied up for hours or longer.

At the nine remote sites, NBCJMA had installed a system of American Sigma 920 flow meters as part of the 1996 launch of its inflow and infiltration (I&I) program.

"The authority did it right," said Warren Gormley, manager of NBCJMA. "Every site has a Palmer Bowlus flume, one of the sites had an existing Parshall flume — a site that flows probably forty million gallons through it in a month — and we installed eight-foot-diameter manholes that are all painted on the inside. And all of our controls are housed in aluminum cabinets above ground."

Meters chosen by the authority in 1996 were state of the art for the time. Each of these recorded flow data in 15-minute intervals, 24 hours a day. Data from the meters was downloaded manually once a week over dial-up phone connections, and the meters themselves ran on AC electrical power. Each meter ran an ultrasonic level

sensor to collect data on the flume depth and, where applicable, the authority used a redundant combined depth and velocity sensor.

"I'd get bills for all of the sites," said Gormley. "I'd get bills from PECO [the local electrical power company] and from Verizon every month for all of these phone and electrical lines. We had to pipe all of the wiring, the phone lines and the demark boxes. In a year, we'd spend \$500 on PECO, and \$600 on Verizon."

Gormley turned to the engineering consulting firm Gannett Fleming for a more efficient solution, and the engineers engaged New Hampshire-based Flow Assessment Services, the company that monitored the original meters. As a flow service provider serving the northeastern United States, Flow Assessment specializes in sewer system evaluation and flow monitoring, performing wastewater collection system studies to find the most effective solutions for municipalities.

"We monitored the meters, and what Newtown had was good — but it was lacking in communication and power," said John Sokol, Senior Data Analyst for Flow Assessment. "To collect the data, you had to initiate a connection from the outside — in other words, you had to call the meter — and this was only being done once a week. So the data was recorded in 15-minute intervals, but we only saw it once a week, so there would be huge gaps in reaction time."

In addition, the dial-up connection to the monitors had all the dependability issues that are familiar to phone line modem users. Sometimes the modem could not connect to the monitor, delaying the collection of information.

Solving problems as they happen — or



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even before — is part of NBCJMA's working philosophy, Sokol said.

"Newtown has always been proactive — they repair problems the same day they're found," he said. "They saw that this system wasn't allowing them to react fast enough. So they were enthusiastic about making an upgrade."

Flow Assessment Services recommended a move to Telog Ru-33 Recording Telemetry Units. The Telog remote telemetry units (RTUs) on this project (also known as Telogers in the field) were provided with solar power, eliminating the need for AC power or field visits to change batteries. The RTUs employ switched packet protocol, which uses the Ethernet capabilities of the existing cellular infrastructure to push data in 15-minute intervals to the remote server at Flow Assessment, where a Telog Enterprise information management system is hosted. The nine dedicated telephone lines are no longer required, and Flow Assessment no longer needs to call the monitors manually to collect information.

This frequent, regular delivery of data allows technicians to review data in a few minutes instead of a few hours, with the



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added ability to compare data from different meters onscreen. The system can also alarm the authority immediately if a flow or level threshold is exceeded at the point of measurement, and send an e-mail or text message to the designated technician.

"This cuts our time to view the data. What used to take two hours we can now do in 10 minutes," Sokol said. "We can keep a better eye on things."

The conversion to the new monitors began on February 16, 2006, with Flow Assessment pre-programming the monitors before providing them to the installers at NBCJMA for placement in the remote sites.

"I can pre-program them and hand them off to our crews so they can focus on

the flow meters and the data," said Sokol. "The monitors are flexible and very easy to use."

Since the first day of installation, NBCJMA saw a difference in the frequency and quality of the information it received.

"We haven't had a single problem since 2-16-06," said Gormley. "It's communications made easy. We have more readings and a better feel for the data — and the best day was when I called Verizon and PECO and cancelled our service to the sites. I started saving money from the first day."

With more accurate information arriving on a far more regular basis, NBCJMA can find a problem before it leads to overflow and flooding, Gormley said.

"We can pinpoint anywhere we have a problem in rain events," he said. "Before, we did a lot more going out and checking, and a lot more maintenance. Now, if we have a problem, the system will call and tell us."

The value of the new system became particularly clear when data arrived one day in 2007 from the monitor at the location of a major industrial commons.

"The monitor told us we had excess flow — another 300,000 gallons more flow than we normally record for the

month," Gormley said. "We went out and put in two portable meters, and we traced it back. It turned out that one of the mower guys had hit one of our manholes and knocked the frame and cover off, and it was in a drainage area. It would pick up the water, and drop it right in there. So with the portable meters and the meter sites, we were able to find it within two rain events, and boom, we corrected the problem. The more readings you have, the more you can tell when there's a burp in it and you've got something wrong."

This kind of information allows NBCJMA to take a proactive stance against field issues, making the best use of the small staff's time by fixing problems before they become emergencies.

"It's just another step that makes everything easier," Gormley said. "Since we have all the new Telogers, we haven't had a glitch — it's unbelievable how they run. This is money well spent." **WW**

#### About the Author:

Randi Minetor is a freelance writer who specializes in wastewater management and other industrial and environmental issues. She lives in upstate New York.