

# Pre-Chlorinated Pipe Bursting Heading North

By Bradley Kramer

Pre-chlorinated pipe bursting potable water lines have been in vogue in Europe for the past 20 years. The pipe replacement process crossed the Atlantic seven years ago when Florida became the first state to approve it in the United States. Now the method has made its splash in the Midwest.

Fort Wayne, Ind., contracted Murphy Pipeline Contractors to use pre-chlorinated pipe bursting to complete a 10,000-ft water main replacement project in a residential area. The project started in late July and finished in early September — about seven weeks in all.

Murphy Pipeline was founded in 2000 by English-born Andy Mayer, who claims the feat of bringing pre-chlorinated pipe bursting for water distribution from Europe. He has spent the past 20 years using the process and saw no reason why it couldn't work in the United States. "For me, it's a no-brainer," he says.

Pipe bursting has been used in the United States for sewer pipelines, but so far it has not quite caught on for water distribution, except in the South, says Todd Grafenauer, a man of many hats at Murphy Pipeline who

## Indiana Project Marks Milestone for Process in Midwest

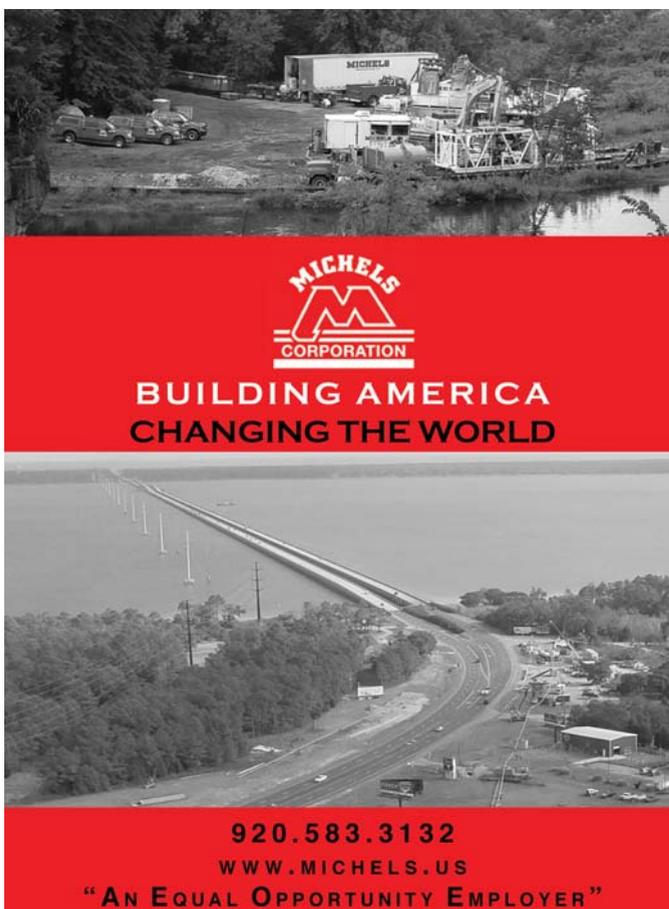
was a consultant for the Fort Wayne project. The main obstacle to spreading the method northward has been education.

"Nobody's known about it," Grafenauer says. "This project was the opening up for the Midwest."

Mayer helped get pre-chlorinated pipe bursting approved through the Florida Department of Environmental Protection and the Florida Section of the American Water Works Association (AWWA) in 2000, making the state the first to approve pre-chlorinated pipe bursting for potable water lines.

For the next few years, Murphy Pipeline did the majority of its work in Florida, Grafenauer says. Approximately two years ago, the company started to make contacts in northern states in an effort to educate communities and spread the method throughout North America. Grafenauer contacted Fort Wayne in early 2005.

Grafenauer worked closely with Fort Wayne assistant manager of engineering Matthew Wirtz and the State of Indiana



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to get pre-chlorinated pipe bursting approved as a pilot project in the city. Wirtz had heard of pipe bursting, but did not consider it until he learned of the pre-chlorination process.

What Wirtz likes about pre-chlorination is not having to set up temporary services.

"Temporary services limited us to when we could do the project," Wirtz says. "We couldn't do that in the winter. We just saw the trade-off of controlling that the water would be off the one time, for eight hours or so, was a much better deal."

Fort Wayne has been progressive with its buried infrastructure projects, Wirtz says. Now, the city can serve as an example to other regional communities that may be considering pipe bursting as an option. Wirtz suggests that communities consider the cost benefits of all solutions for pipeline improvement, but adds that the value of a completely new pipeline and minimal restoration that pipe bursting offers are among the biggest benefits.

Grafenauer can't predict how long it will take for pre-chlorinated pipe bursting to latch on in the Midwestern and northern states. As an example, he points to Florida, where the process is now considered for nearly every pipe replacement project in the state. In Europe, he says, the method is used 85 percent of the time.

"Now that Fort Wayne has done some projects, they'll at least include it in their [project bid] specifications," he says, adding that he wants to educate more cities in the region about the process. In fact, Murphy invited other municipalities in the region to visit the project site and learn more about pipe bursting. It attracted representatives from Kentucky, Michigan, Missouri and even Washington.



Pre-chlorinated pipe bursting has been approved for use in 36 states.

The benefits of pipe bursting water lines, Grafenauer says, are that it is faster, requires less engineering, is more efficient and therefore costs less than other forms of pipe replacement.

"If you look at directional drilling or open-cut on a similar 10,000-ft project, with restoration and everything else, it would have taken them roughly 20 to 30 percent more time," Grafenauer says.

The chlorination process with water line pipe bursting can be done before or after the burst. Pre-chlorination follows the same AWWA standards (C651-99) for disinfecting water mains as post-chlorination.

However, because pre-chlorination is done in the staging area, along with the fusion and pressure testing, the crew is able to move faster and more efficiently, Grafenauer says. In addition, the crew is only in front of the customers' houses for one to two days.

"Residents really like that we're generally only outside their houses for one day instead of three or four weeks, as you'd see with a traditional open-cut method," Grafenauer says. In addition, the less time the projects takes, the less labor costs.

Pipe bursting typically employs high-density polyethylene (HDPE) pipe, Grafenauer says. HDPE is a proven material for pipe bursting, but it is not yet approved in all municipalities in the United States. Fusible PVC pipe also has been considered, although PVC is still in research and development phases for pipe bursting.

Part of getting this method approved in municipalities is getting HDPE pipe approved first. The material often is attached to pre-conceived misconceptions, Grafenauer says. Fallacies about pipe diameter is a concern he hears often, pointing out that HDPE pipe is available in the same outside diameters as other materials.

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In order to get pre-chlorinated pipe bursting approved in municipalities, Grafenauer has helped with feasibility studies to determine if the process will work for the project, as well as save on costs. One area the process helps save money is with engineering.

Pipe bursting a line involves digging an entry and exit pit, typically 300 to 600 ft apart. Using a static pipe bursting machine — in this case Murphy used a HammerHead machine — the crew thrusts a rod string through the existing pipeline.

“One of the neatest benefits with this process, from a planning standpoint and the amount of cost and labor that goes in prior to a project, is the minimal amount of engineering that goes into a project of this nature,” Grafenauer says. “We follow the existing utility path, which lowers design and engineering fees associated with utility relocation design, not to mention easement, line separation and real estate purchasing challenges that are eliminated with the process.

“From an overall cost standpoint, it’s definitely a pretty big factor that communities need to take into consideration. I’ve seen engineering costs anywhere between 5 and as high as 50 percent of construction costs on traditional replacement projects.”

Once the rods reach the entry pit, the crew attaches the bursting equipment — a pipe splitter (if there are any repair sections on the line) or a bursting head plus an expander — followed by the HDPE pipe and pulls the rods back, breaking up the old pipe, pushing the fragments into the surrounding soil and inserting the new pipe in its place. The crew is usually permitted only 10 hours to interrupt water service, which is one of the few limits on length, Grafenauer says. Typically, Murphy bursts 300 to 600 ft per day.

Although the new pipe is chlorinated before entering the ground, it gets additional “super chlorination” after it’s installed. However, the additional chlorination lasts only 15 minutes.

A limitation to pre-chlorinated pipe bursting is the diameter of pipe, Grafenauer says. Pipe bursting is best used for pipe diameters from 2 to 12 in. Larger sizes become difficult to pre-chlorinate because of the large volume of water needed. However, the size limitation is seldom an issue as most water line projects are for 6- and 8-in. pipe.

Sizing also comes into play when considering changing pipe diameters during replacement, particularly upsizing to a bigger pipe. Industry standard is for size on size or one upsize. If upsizing two or more sizes, a feasibility study needs to be addressed for each project, Grafenauer says. If the change in size is too great,

there is a risk of surface heaves, which can damage roads.

Soil is seldom a concern with pipe bursting. Compacted soils are more prone to surface heaves, especially with larger diameter pipe and more aggressive runs, but those issues are usually resolved in feasibility studies.

Pre-chlorinated pipe-bursting continues to spread across North America, Grafenauer says. Currently, 36 states have approved the process.

“We’re like chameleons,” Mayer says. “We’ll adapt to anything and go anywhere.”

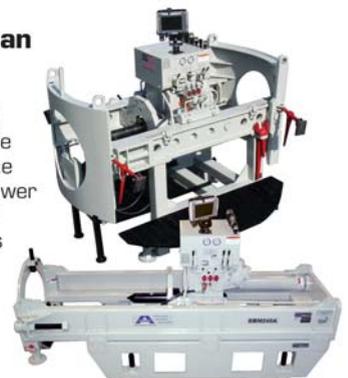
Bradley Kramer is assistant editor of *Trenchless Technology*.



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