

PROBLEMSOLVER

Delivering Water to a Drought-Stricken Community

By Tony Radoszewski

The Richland-Chambers Reservoir and HDPE pipe supplied water to 25,000 residents when their city was three weeks away from severe drought

Water and the city of Corsicana, Texas, have an interesting past. Corsicana, located about 50 miles south of Dallas, is where oil was first discovered west of the Mississippi River. In 1884, the city hired a water well driller but instead of hitting water, oil spurted from the well. City officials were so unhappy that they refused to pay the contractor, but soon after, Corsicana became the first Texas oil boomtown.

Drought conditions

Earlier this year, Corsicana's city leaders had a much more serious reason to be unhappy with the water situation—they were running out of it.

The city's two water sources, Navarro Mills Lake and Lake Halbert, began showing initial signs of depletion in 2006. Even after the city implemented emergency repairs, the drought continued into January 2007. By then, when Navarro Mills' water level had dropped more than eight feet below normal levels, three feet below moderate/restricted use levels and hovered less than two feet from severe/no-outdoor-water-use levels. As of early summer, the drought had surpassed the year-and-a-half mark.

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In 2006, city officials were forced to figure out a way to get water quickly to 25,000 residents. The answer was to pipe the water from the still-plentiful Richland-Chambers Reservoir, southeast of the city. Because of its immediate availability and low cost of installation, smoothwall high-density polyethylene (HDPE) pipe was chosen for the emergency pipeline.

"Due to the railroad lines and the restricted right-of-ways on this project, HDPE was really the only pipe that could be used for this project," said Larry Murray, the city's environmental services manager. "We had just three or four feet around the pipeline to work with. Other pipes would have needed much bigger right-of-ways for the trucks, welders, etc."

Murray added that the HDPE pipe has a highly recoverable market value should the city ever decide to sell it when the emergency line is no longer needed. The pipe also could be reused for another pipe project elsewhere in the city. A permanent line will be installed after October 2008.



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Since Corsicana has some rights to the water in the Richland-Chambers Reservoir, the city struck a deal with the Tarrant County Water District (TCWD) to tap into the district's transmission line to supply water to Lake Halbert and ease drought conditions.

The 16-in. polyethylene line ran from the TCWD transmission line to an existing city line leading to Lake Halbert. The line was mostly laid above grade with five directional bores—two under highways, two under county roads and one creek crossing. It delivers 4 mgd to the city, which meets about half of the community's daily needs.

"When we got the call, we were told the city was about three weeks away from the severe drought category," said Tom Fraser of Fraser Mining. "We were able to install an average of about 2,500 ft of pipe per day."

Quick installation

The emergency pipe project began on Oct. 2, 2006, and was completed on Oct. 18, 2006. About 26,000 linear ft of pipe were installed using a four-man crew and three fusion machines. Fusion joining creates a leak-free, monolithic pipe string and eliminates the need for restraining devices on joints and fittings.

"With the purpose of this project being to deliver water to a drought-stricken community, any water leak would be totally unacceptable," Fraser said.

Fraser added that the biggest challenges were maneuvering through the lower areas of a floodplain, the creek crossing and the underground borings. The shortages of time and right-of-ways meant that cooperation with the city was crucial.

"The city had used PE pipe in directional drilling and pipe-bursting projects in the past," Fraser said. "Because it's a temporary line, we knew most of the line would be above grade. But since the joints were leak free, and the pipe itself is black, we were not worried about leaks or UV degradation. And the flexibility of the pipe lends itself perfectly to the underground installation sections." **WWD**

Tony Radoszewski is executive director for the Plastics Pipe Institute. He can be reached at 469/499-1044 or by e-mail at tonyr@plasticpipe.org.

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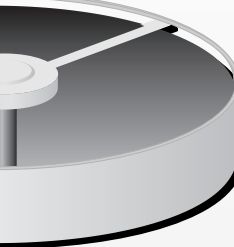
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Handbook

With applications such as the one in Corsicana in mind, the Plastics Pipe Institute (PPI) has recently published a comprehensive handbook to assist designers, contractors and owners with designing and installing HDPE piping applications. Directional drilling itself is not a new concept, but the book covers such special topics as pullback force capability, collapse resistance and long-term performance of the PE pipe once it's installed in the bore hole.

"Polyethylene pipe is ideally suited for these demanding installations because of its continuous, jointless fused system and because of its flexibility, corrosion resistance and seismic resistance," said Camille George Rubeiz, P.E., director of engineering at PPI.

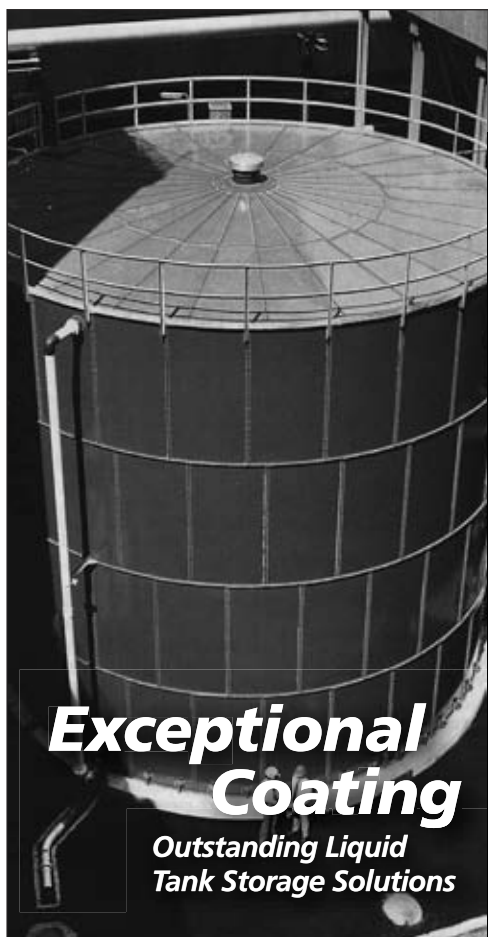
Other topics in the handbook include design, such as pressure and flow capacity, buried pipe and thermal considerations; engineering properties; PE pipe and fittings manufacturing; specifications, test methods and codes; joining procedures; marine installations; and pipeline rehab by sliplining.

Corsicana project manager Jerry Yates of Fraser Mining used directional drilling techniques to make the 250-ft creek crossing from Richland-Chambers to Lake Halbert.

"HDPE makes it easy to pull a sleeve for your underground bores, then pull the pipe right through that," Yates said. "In environmentally sensitive areas, this installation technique is the best thing going. Plus, we didn't know exactly what 'temporary' meant, so we needed a pipe that would last a long time and not be susceptible to corrosion." **WWD**

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