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Water Conservation for Long-Term Water Supplies

Idaho Town Turns to HDPE with Future Growth in Mind

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Drew L. Wilson — Jun 01, 2008



When the Mayor of Cascade, Idaho, set into motion his plan to improve his community, he knew that a top priority would be a basic need – water. Not that the town was running out of water, it's just that its infrastructure was in need of major repair. His solution: Replace the city's entire water and wastewater system with high density polyethylene (HDPE) pipe.

"The secret is out and people understand that Idaho is a marvelous place to live," said Mayor R.W. Carter about the population explosion that is taking place in southern Idaho. "We have all the

amenities that go with recreational areas like Vail, Park City and other resort communities," said Carter. "It's bringing people who want to live in an aesthetically stunning place with outdoor adventure, and the thing that will support every facet of the community's impending growth is water."

Cascade is a small lumber mill town that is trying to bring its piping infrastructure into the 21st century. Cascade's piping infrastructure was similar to a lot of towns across the country –under funded and neglected. The history of the public works department was one of buying whatever pipe was the cheapest at the time of needed expansion or repair. "Every kind of pipe ever invented over the years has found its way into our system," said Carter.

A large new resort near town is attracting people from everywhere on the globe and Carter wants to be prepared for the expected triple in population in the near future. After receiving funding from the Department of Agriculture, city leaders started the daunting task of determining what methods and materials they would use to replace the system.

"We want to be equipped with a system that will last far into the future so that the people who choose to build their lives here will know that they are building their homes and businesses on top of a state-of-the-art system." said Carter. "And when I started talking to civil engineers about piping materials, the basic answer seemed to be, 'if it's not HDPE, you're using the wrong material.' "

That is when Carter contacted Fred J. Ostler, P.E., of Project Engineering Consultants Ltd. (PEC). Ostler was the past AWWA National Director for Utah and Idaho and also the water superintendent for the City of



Pocatello, Idaho. PEC, based in the Boise area, has become heavily involved in trenchless forms of construction, and Ostler has become a huge proponent of HDPE.

"We have always been drawn to cutting-edge technologies in civil engineering and we have excelled in trenchless technologies over the last 12 years," said Ostler. "A lot of the mindset in the past has been that water systems have to be ductile iron. I never accepted that mentality because as soon as you put ductile iron in the ground it starts to rust. Everything the industry said to do to stop corrosion fails over time and is an extra expense that could be avoided by using HDPE. But the added benefits with HDPE of zero maintenance and zero leaks blew me away."

Plastic Pipe

HDPE was first developed in the late 1960s for the gas industry because of its leak-proof qualities. Today 90 percent of all new underground gas lines installed are HDPE. According to 1999 Gas Facts, there are 380,000 miles of HDPE gas mains and 28 million service lines in the United States. There is an average of fewer than 10 leaks a year caused by something other than third-party damage.

While incremental improvements to the nation's water distribution systems have been made over the last 100 years, many like Ostler feel it is time to aggressively implement the latest technologies like trenchless construction and HDPE to the water industry.



For instance, it is commonly believed that a leak rate of 10 to 15 percent is a normal, acceptable level. Times have changed since the first half of the 20th century when populations were smaller, labor was cheaper and water was relatively plentiful. City officials like Carter are now directed more toward conservation, cost and safety. As such, governmental regulatory agencies and conservationists are reviewing water distribution systems and paying heavy attention to leak management; and, they are finding the costs staggering.

According to the Community Water System Survey, water utilities self reported leak rates average 13 percent. One study by the International Water Supply Association states that 20 to 30 percent of water never reaches its intended destination. Whichever number one believes, the effects of such high leakage are taking their toll.

"With fused joints, the pipe line has no weak link so there are no leaks," says Brian Shields of High Country Fusion (HCF), which is based in Fairfield, Idaho. HCF supplied the HDPE pipe, McElroy fusion equipment and fusion training for the project. "HDPE pipe has proven itself over the last 30 years in the gas industry and is starting to make a big impact in the water industry. Cascade has even had enough forethought and wisdom to pass an ordinance that mandates that, whenever possible, HDPE is used."

Increasing Focus on Conservation

Shields points out that because water is one of the highest priorities in the West, it is the area in which HDPE can make a major impact because of its conservation properties.

The battles over water control in the state are becoming heated and law practices that specialize in water law are among the most successful in the state. An entire section of Idaho Code is now devoted just to water. Shields feels that as water becomes even more valuable and the news of these types of HDPE water

pipe lines spreads, the door will open for HDPE to become a solution to the water shortage problem and ultimately make his job of selling the pipe easier.

"All together there will be close to 30,000 feet of new HDPE in sizes ranging from 24-inch diameter down. The entire system will be fused together," said Shields. "When Cascade is done with this project, it will have a strong backbone of HDPE and it will give it the ability to deal with growth instead of chasing and fixing leaks."

"A lot of small towns have the same problems that we have," said Carter. "And we figure the maintenance savings over the life of the system will save us a significant amount of money. We jumped on the technology because we are looking for ways to save money."

Ostler indicated that in the City of Pocatello in 1993, water was 73 cents per 1,000 gallons. Now it is up to \$2.50 per 1,000 gallons. At least one-third of that cost can be associated to pipeline replacement projects. "There are a lot of civil engineers who started in the late 1970s who are now designing replacement systems for the ones they put in 20 or 30 years ago. Sadly, many of them are designing the new system with the same materials they are replacing. We don't want to do this again in 30 years."

Ostler said that the field of civil engineering is changing due to the high cost of construction. "And when you examine the life-cycle cost of HDPE, it can be the best value," said Ostler. "The trenchless applications just further its advantages because projects are faster and less intrusive to the clients of the system. I have to be aware of that as a professional, it is incumbent upon me to get the client the best value for his money.

"The civil engineering community needs to make a paradigm shift in forecasting projects correctly and including life-cycle cost with the design of the system. I have an obligation to show everyone I deal with the long-term advantages of HDPE to make sure that the client is getting the best information to make the long-term decision. And to assume that a project will be done with an inferior material because that is what the client wants, then it is probably not the best thing for PEC to do. We want to step it up with every project we design, so we get pretty brave and say, 'Mr. Client, I respect that option but I can show you an HDPE option that is better.' "



Ostler continued, "Most civil engineers don't come from a public works background, but if you come from a public works background you have felt the heat of answering to the politicians and the taxpayers about the decisions you make and the money you spend. You understand what it is to maintain a pipeline and what it is to get it constructed and what it is to answer to the public. Too many times we go to a bond election and find out that a 20-year-old pipeline needs to be replaced because of costly ruptures, leaks or corrosion, and I just want to make sure that what I

suggest is best for the community."

Said Shields, "HDPE is not the easy way to go for an engineer. There is a learning curve but it is not rocket science.

A fusion technician can be trained in a day. In fact, I spend more time convincing people to try HDPE than I do training them on how to use it. Long-term maintenance is what it is really about and with regular payments from the community this pipeline will save this community millions in the future."

Drew L. Wilson is a writer, photographer and filmmaker living in Tulsa, Okla.

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