Polyethylene Pipe Plays Role in Wastewater Treatment Plant Renovation

The Town of Denton, Maryland recently installed a 400-foot-long high-density polyethylene (HDPE) pipe as part of needed wastewater treatment plant upgrade. The smooth-walled HDPE pipe is an important component in the treatment plant’s enhanced nutrient removal upgrade. Within the 54-inch diameter DR 32.5 pipeline, chlorine will have adequate contact time with effluent to help disinfect the town’s wastewater before being chemically de-chlorinated and released back into the environment.

The environment is of key concern in the Chesapeake Bay area, with Denton’s treatment plant being one of the 67 major treatment plants deemed to have a big influence on the health of the Chesapeake Bay. In recent years, the bay has realized algae growth and worsening water quality.

The upgrade, which is expected to complete this month, is an effort to lower the amount of nitrogen and phosphorous released into the Chesapeake Bay in accordance with the Chesapeake Bay Agreement of 2000.

Wastewater Quality and the Environment in Maryland

Legislation like the Chesapeake Bay Agreement of 2000 is not unusual to the Chesapeake Bay area.

The reduction of nitrogen and phosphorous is critical to the health of the Chesapeake Bay. Over the years, the water in the bay has experienced a decline in quality because of excess nutrients coming into the bay. The nutrients spur algae growth that blocks sunlight, suffocates seabed grasses and deprives some areas in the water of oxygen. To combat the debilitating effects of the excess nutrient product, various programs and legislation has been put in place to try and reduce what goes into the Chesapeake.

As part of the Chesapeake Bay Agreement of 1983, the Denton Wastewater Treatment Plant received an upgrade to remove nitrogen through biological nutrient removal. Using the nutrient removal, Denton’s treatment plant removed more than 90 percent of pollutants with a nitrogen concentration below 8 milligrams per liter total nitrogen.

When the Chesapeake Bay Agreement of 1983 ran out, a new agreement was signed. The new agreement set greater goals for reduction in nutrient pollutants entering the Chesapeake Bay from agricultural irrigation, stormwater runoff and wastewater treatment plants. Once upgraded, treatment plants like those in Denton were expected to reduce nitrogen and phosphorus in the wastewater, down to 3 milligrams per liter total nitrogen and 0.3 milligrams per liter total phosphorous.

The Town of Denton’s Enhanced Nutrient Removal upgrade project is funded by the State of Maryland through the state’s clean water revolving fund and a state grant. The total cost of the project is slightly more than $5 million. “Once we’re upgraded, we (the 67 major wastewater treatment plants in the Chesapeake Bay area) will have satisfied one-third (wastewater) of the Chesapeake Bay 2000 agreement, leaving stormwater and agriculture to comply,” said Mark Chandler, manager of water and wastewater operations for the City of Denton. “We’ll be performing at total compliance.”
Project Design

To upgrade the Denton Wastewater Treatment Plant, engineers decided to install post-anoxic reactors, deep-bed upflow denitrification filters and chemical feed systems.

Also as part of the upgrade, a key pipeline was excavated and replaced. Previously, a 33-inch corrugated HDPE pipe with integrated steel bands was used to host effluent to be disinfected over time. A chlorine contact chamber allows even more detention time and provides optimum chlorination through plug-flow conditions.

An engineer on the project stated that “the interruption of the plant’s hydraulic profile to include a deep-bed filter rendered the existing 33-inch pipe impractical for reuse. The loss of the pipe led to several hundred feet of piping length loss, or loss of contact time and volume for disinfection. In order to provide the same volume in a much shorter distance, we had to significantly increase the pipe size to 54 inches to make up for the lost volume. Polyethylene was found to be the most economical.”

Fusion Process

Lead contractor J.L.W. and Associates hired in Ferguson Industrial Plastics to complete the pipe fusions on the project. Ferguson provided a fusion technician and McElroy MegaMc™ 2065 fusion machine for the short fusion project.

The MegaMc 2065 used to fuse the pipe at the jobsite is one of the largest fusion machines in the world, with the ability to fuse pipe sizes from 20 to 65 inches in diameter.

Ferguson also fabricated a 45- and 22.5-degree ell using butt fusion that was used in structuring the pipe to fit the design needs of the project. The fabricated parts were trucked to the site, and fused onto the length of pipe before being installed.

Once pipe and fabricated piping were on site, 50-foot lengths of the pipe were fused together to create a long, monolithic pipeline. The 45- and 22.5-degree ell was fused to a shortened length of pipe approximately 25 feet long. A final tie-in fusion was performed, linking the long length of piping to the ell that would be installed into a bank of filters. The fusion process took less than two days.

“I have never worked with such a large diameter of this type of pipe (HDPE), but I found it to be almost as easy as working with smaller sized pipe,” said Jason Clopper, superintendent on the site for J.L.W. and Associates. “I would definitely like the opportunity to work with it again on future projects.”

Sincerely,

Tyler Henning

P.S. – Do you have an interesting job site that you would like to share? McElroy is always looking for fusion job sites where HDPE is being used and fused to solve an infrastructure problem. Contact Tyler Henning, public relations specialist at (918) 831-9286 or by email at thenning@mcelroy.com

Certified McElroy Rental

There are plenty of rental fusion machine options in the marketplace, but how do you know if your next rental machine is properly maintained and ready to perform?

Choose a better fusion rental experience with Certified McElroy Rentals. Certified McElroy Rental fusion machines are available at participating distributors across the United States and Canada. Here are the advantages of choosing a pipe fusion machine from a Certified McElroy Rental fleet:

- Certified McElroy Rental equipment gets better overall care than other rental machines. Your participating McElroy distributors adhere to a comprehensive checklist for every rental machine in their fleet.
- Machines in the rental program are constantly maintained to be in the best condition possible – all parts of the machine, from top to bottom, are checked. These checks include electrical, hydraulic, facer, heater, and much
more. When a repair is needed, only Genuine McElroy Parts are used.

- Factory-trained inspectors look over the machine after each rental. If repairs are needed on a machine, McElroy factory-trained mechanics are on-hand to perform repairs.
- Certified McElroy Rental distributors are audited to ensure that each fleet meets the high expectations of the program.
- Certified McElroy Rental offers more security and reliability giving you the ability to get the job done.

To locate your next fusion rental machine, visit www.certifiedmcelroy.com to find a participating McElroy distributor near you.

**NEWS AND EVENTS**

**Take Part in the Industry’s Best Training**

Two McElroy University classes have been added to the 2011 calendar. That makes a total of five opportunities to get industry-best training from the pipe fusion experts!

The two new classes that have been added are in October:

- **Small Diameter Operator Qualification** will be held from October 3-5 in Tulsa.
- **Mid-Range Operator Qualification** will be held from October 5-7 in Tulsa.

These two classes are great for getting fusion operators qualified on fusion machines from the tiny Mini-Mc™ to the 618 line of fusion machines. Classes are a mix of 30 percent classroom and 70 percent hands-on training.

In November, McElroy University will hold three classes. All of the classes take place at the McElroy Campus in Tulsa, Oklahoma. Visit www.mcelroy.com/training to choose between these remaining classes:

- **Large Diameter Troubleshooting and Rebuild**
- **TracStar Troubleshooting and Rebuild**
- **Large Diameter Operator Qualification**

McElroy University classes are structured so that the skills learned and the machines used in each class closely match the types of machines found together on the jobsite. We offer training at our facility or yours. Our uniquely qualified McElroy University course instructors are professionals, each offering years of industry experience. To find out more about the full range of McElroy University courses, visit www.mcelroy.com/training.

**McElroy to Exhibit at Midwest Energy Association's Annual Gas Operations, Technical and Leadership Summit in August**

If you are in the Ames, Iowa area on August 2-4, McElroy will be exhibiting at the 88th edition of the conference. The summit is an excellent opportunity for utilities and vendors to share ideas, explore new technology and discover solutions to common problems.

Many of the vendor exhibits demonstrate equipment and processes that help utilities save time and money. McElroy’s booth will fit right in. On display will be:

- Pit Bull 26: ??????

To find out more about the Midwest Energy Association’s August Summit, visit www.midwestenergy.org.

**NEW TO CONNECTIONS?**

Make sure it always reaches your inbox – click here to subscribe.

**McELROY AROUND THE WORLD**

Our pictures this month come from McElroy's distributor in Mexico, Geomembranas y Geosinteticos S.A. de C.V. In the
pictures, a MegaMc™ is busy working on some Fusible PVC near Tampico, Mexico. Tampico is in northeastern Mexico and is a major export center for oil, silver, copper and wool.

To find out more about Geomembranas y Geosinteticos S.A. de C.V, visit their website.

If you have photos from a jobsite, we’d love to see them! Yours may be chosen for the next issue of McElroy Connections. Simply email your photos to Tyler Henning, at thenning@mcelroy.com.

RECENT POSTS

- Geothermal is making waves in London, Ontario, Canada. Great story! #HDPE http://ow.ly/5Blq1
  Jul 11th

- Here’s a story about #HDPE in the Puget Sound area. HDPE was used with concrete anchors for an outfall line. http://ow.ly/5zLKG
  Jul 8th

- Always great to see #HDPE going in! Here’s a story about hydroelectricity uses and 132 inch HDPE piping! http://ow.ly/5zLDD
  Jul 8th

- Do you know groundwater and water-well terms? #NGWA has an app for that - Lexicon of Groundwater and WW System Terms: http://ow.ly/5sQGm
  Jul 1st

- Great overview of #HDPE pipe uses with a geothermal focus. Courtesy of Associated Content: http://ow.ly/55sQGm
  Jun 29th

- Need a rental fusion machine? We suggest www.certifiedmcelroy.com! Get a fusion machine rental that is up to your standards and ours.
  Jun 22nd

- It's better when u know the job is done right. Get to know our 2 DataLogger models, quality assurance when fusing #HDPE http://ow.ly/5mTei
  Jun 21st

- Are you in or near Columbus, Cleveland or Pittsburgh? The Alliance for PE Pipe is coming to town. Click on the attached link to find out when and where the Road Show will stop!
  Jun 21st

- Cove City, NC is putting in #HDPE as part of landfill project. Why aren't you using HDPE? The story: http://ow.ly/5zJFX
  Jun 20th

IMPORTANT LINKS

- Alliance for PE Pipe
- WaterWorld
- Water Tech Online
- North American Society of Trenchless Technology
- Plastics Pipe Institute