

PROGRESSIVE CONSULTING ENGINEERS, INC.
Civil · Water Supply · Municipal

WATER BULLETIN

Water Distribution System Modeling — Brooklyn Center, MN

The City of Brooklyn Center retained PCE to complete an analysis of the water distribution system to determine if any part of the system can be improved by modifications to watermains during their 2011 Residential Road Construction Project. The neighborhood improvement program includes the East Palmer Lake neighborhood, located between Palmer Lake and Humboldt Avenue.

The City is planning to replace the old watermains in the East Palmer Lake neighborhood with new ductile iron pipes in conjunction with a road reconstruction project. The existing City water distribution system computer model will be updated with WaterCAD modeling software. Different

scenarios will be simulated with the computer model to determine if and how changes to water pipe diameters in the East Palmer Lake neighborhood could improve the water circulation, velocity, pressure, and available fire flow capacity throughout the City. A technical memorandum will summarize the modeling results and provide recommendations to improve distribution system performance.

Over the years, PCE has completed similar studies for each reconstruction area within the City.

Opflow Publication

An article titled "Small City Tackles Radium in Well Water", authored by Naeem Qureshi from PCE and Greg Volkart, Director of Public Works for Goodview, has been accepted and is scheduled to be published in the January 2011 issue of the Opflow AWWA publication.



Presentation

Adam Kramer made a presentation titled "Water Sustainability Through Conservation" to the Minnesota Public Works Association at the Annual Conference in November 2010. The presentation discussed different water conservation strategies including water reuse.



Filter Rehabilitation—New Ulm Public Utilities

The New Ulm water plant was constructed in 1992. In 2008, New Ulm Public Utilities retained PCE to conduct a filter evaluation of the water plant. Based on the study conclusions, PCE conducted a pilot plant study of three different media; one being the existing media. PCE prepared the plans and specifications for the purchase of media, wash water troughs, construction, and provided construction services for the filter rehabilitation. The water plant rehabilitation project was completed in the spring of 2010. The water plant has seen a marked improvement in performance with longer filter runs and improved water quality. The backwash water volume decreased from 5.39% of the water treated to 2.5%, thus increasing the plant's capacity.

The results of the rehabilitation comparing plant performance in November 2009 to November 2010 are shown below:

Parameter	Prior to Rehabilitation	After Rehabilitation
Backwash	3.5 feet @ 1600-3200 gpm	7.5 feet @ 3400 gpm
Backwash Volume	5.39 % of water treated	2.5% of water treated
Effluent Iron Fe*	0.04 mg/L average	0.02 mg/L average
Effluent Manganese*	0.05 mg/L average	0.04 mg/L average

*The peak concentrations were lower after the rehab than prior to the rehab

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Water and Sewer Rate Study — Zimmerman, MN

The City of Zimmerman supplies water and sanitary sewer services to their customers, which are primarily funded by the rate charges and water availability charges/sewer availability charges (WAC/SAC). The City is currently using a flat commodity rate with the minimum monthly customer charge based on the size of customer meters.

The Minnesota Department of Natural Resources (DNR) requires that all public water suppliers serving more than 1,000 people adopt a conservation rate structure to promote water conservation. The DNR does not consider a flat rate structure as a conservation rate structure and it is necessary

that the City revise the water rate structure to meet the DNR requirements. The City retained PCE to conduct an evaluation and update their existing water rate structure to implement a conservation water rate structure as required by the DNR and also to update their current sanitary sewer rates and WAC/SAC charges. The City is looking for two different alternatives for the conservation water rate structure to compare and select the best alternative for the City customers.

Water conservation is now being emphasized by a number of utilities and can result in substantial savings for the utility and the consumer. Water conservation promotes a reduction of water usage, which also results in less

electric usage and lower sewage flows. This is significant as about 3% of the nation's electric consumption is for water and wastewater services. PCE will develop two conservation water rate structures: An Inclining Block Rate Structure – a rate structure that charges higher volumetric rates for increasing consumption and a Seasonal Rate Structure – a rate structure that charges different rates for summer and winter use.

Both of these rate structures are identified by the DNR as a conservation rate structure. The study will be completed by the end of February, 2011.

Article in Waterline Regarding Rochester

An article regarding Rochester Public Utilities was published in the Winter 2010-2011 issue of *Waterline*, a publication of the Minnesota Department of Health. The article is as follows:

Rochester Looks to Save with Conservation
Conservation can cut both ways for utilities. Wanting to be environmentally and socially responsible, water systems encourage customers to use water wisely and provide tips on how to conserve water. However, declines in water usage also mean drops in revenues for utilities.

On the other hand, programs to promote wise use of water can yield dividends in the form of cost savings from infrastructure that can be delayed or not built at all. Rochester Public Utilities (RPU) is anticipating that declining revenues can be more than offset by reduced costs as a result of conservation.

In 2009, PCE completed a water conserva-

tion study for RPU along with an examination of alternative rate structures to meet requirements of the Minnesota Department of Natural Resources for water conservation. One of the recommendations RPU adopted was a \$50 rebate for residents who replaced their toilets with more water-efficient units. PCE calculated that RPU could save approximately 13 million gallons of water per year (48 gallons of water per day per household) if 2 percent of the utilities customers replaced inefficient toilets (3 1/2 to 5 gallons per flush) with energy-efficient (1.28 gallons per flush) toilets each year.

"We showed that it made economic sense to do that," said **Naeem Qureshi** of PCE, adding that by implementing just the toilet replacement program, RPU could save approximately \$17,000 a year in capital costs and could defer drilling a 1,000 gpm well (which, along with the well house, would cost around \$750,000 in 2009 dollars). "If a new well can be postponed by a year, the savings in interest, at 3%, would be \$22,500.

PCE and RPU pursued other strategies in promoting water conservation, including a household water audit to show how much water is used, how much can be saved, and educational materials for customers and their children. RPU is also contributing to the cost of a local wetlands and environmental science center that will emphasize two main issues: water and energy resources. "For RPU, education is the best incentive for conservation," maintained Doug Rovang, Senior Civil Engineer for RPU.

"Water conservation is now being emphasized by a number of utilities and can result in a substantial savings for the utility and the consumer," wrote **Naeem Qureshi and Jeny Shah** of PCE, in a report on the RPU conservation efforts. "Water conservation promotes a reduction of water usage, which also results in reduced wastewater flows and less electric usage. This is significant as about 3 percent of the nation's electricity consumption is for water and wastewater services."

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