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BY DESIGN

Recovery from the 1993 Flood: How are Minnesota's Cities Faring?

Spring's meltdown brings speculation about flooding. In central and southern Minnesota, rising rivers rush powerfully to the Mississippi, riveting our attention. Each year conditions converge to alter our landscapes, create a new awareness of nature's power, and give rise to stories of disaster and ingenuity. This year, forecasts for a wet spring invite a look at how local, state and federal governments have responded to the extraordinary flood of 1993.



When flood waters subsided in 1993, Bolton and Menk partnered with cities to assess damage to public and private properties. In many cases, cities had experienced damage because of wastewater and stormwater systems that were damaged by flooding or were inadequate for such extreme conditions. In others, potential contamination of water supplies or surface water due to flooding was the issue. In all cases, change was necessary and its implementation was encouraged by the availability of federal flood relief funds.

Bolton and Menk assisted numerous communities with flood-related projects including Elmore, Fairfax, Frost, Jackson, Marshall, North Mankato, New Ulm, Renville County, St. Peter and Truman providing: assessment of the sources of damage, planning, design, surveying, and construction contract administration. Nearly four years after this most recent record flooding, most

projects are nearing completion. Bolton and Menk's Bruce Firkins explains, "Solutions involved study, written proposals, and the consideration of the proposals by funding agencies. In many cases, the corrective measures have required complex solutions and lengthy public hearing periods. If the solutions were simple, most of the communities would have been able to fix deficiencies on their own. The flood relief funding allowed many cities to get at the root causes of the 1993 damage and upgrade facilities to minimize impacts from future floods."

Cities were assisted in the application process by the area Regional Development Commissions. Byron Jost of Region 9 said, "Once communities had their assessments, proposals and estimates in hand, we helped them through the maze of funding resources. There were many: Minnesota's Department of Trade and Economic Development, Department of Natural Resources, and the Minnesota Pollution Control Agency, and federal agencies such as the Federal Emergency Management Agency, the Economic Development Administration, and the Small Business Administration. Representatives for each of these organizations met periodically to hash out which program would best meet the needs of a specific region."

The result of this work has been numerous accomplishments. In New Ulm, a water supply well



Jackson East River Interceptor Lift Station, 1995

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Partnership: Rebuilding Rural Minnesota

It all began back in the late 1970's when the Southern Minnesota Beet Sugar (SMBS) Cooperative was built and the founders discovered that through the sugar production process, excessive amounts of hot water was produced. In an attempt to use the hot water in a productive manner, a small Federal Grant was received to study the feasibility of a District Heating Program throughout the City of Renville. Proving to be cost prohibitive, the idea was shelved for many years. Over the years, the City of Renville's Industrial Park was evolving but finding it difficult to attract industries.

Coming together in 1995, the City of Renville and the SMBS Cooperative undertook a Waste Heat Recovery System project. The process captures waste heat from the SMBS Cooperative, which is located adjacent to the Renville Industrial Park, and supplies it to the industrial park users.

The SMBS Cooperative effluent hot waste stream is pumped to the heat exchange building and is directed to one of the two hot water heat exchangers. The average temperature of this hot waste stream is between 90 and 120 degrees, with over 6,000 gallons per minute available during plant operations. The heat from the hot

waste stream is captured in the heat exchanger and the cooler waste stream is then returned to the SMBS plant where it



Waste heat facility shown with one of the heat exchange units and a portion of the interior piping system

flows to the existing cooling ponds. The other half of the system is the circulating closed loop which connects the heat exchange building to the industrial park users. Water in this new loop system is heated by the heat exchanger and is pumped to the industrial park. Businesses then are able to take the hot water from the supply, use the heat, and then return the cooled water to the heat exchange building for recirculation.

The initial system includes four pumps and two heat exchangers. Four additional pumps and two exchangers can be added

in the future to increase the system capacity as required by the users at the industrial park. The system is currently designed for 35 million BTUs per hour (winter time operation) with 2000 gpm of hot water circulating through a 24" diameter pipe system.

Construction of the project began last summer and included the installation of the hot water lines to the industrial park and the construction of the heat exchange building, which will be operational by early spring. The City of Renville received a federal grant in the amount of \$507,000 from the Economic Development Administration (EDA) to assist in the construction of the waste heat recovery system. Repayment of other funds required for this project is anticipated from industrial park user fees.

The first user of this new system will be the MinAqua Fisheries. The MinAqua Fisheries facility uses an aquaculture process and intends to use the heat supplied by the system to warm the water for fresh fish farming for human consumption. MinAqua intends to produce a warm water fish called tulapia which is said to have a taste and texture similar to walleye. They anticipate having the construction of their buildings or "barns" completed by this summer. Other potential users who have expressed interest in utilizing the heat system are greenhouses and hydroponics. Hydroponics is a unique way of growing plants using water instead of soil. It is thought that the aquaculture effluent could be used in this process, thus

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situated on the flood plain was saved from contamination through heavy sandbagging during the flood. BMI worked with the City to raise the elevation of the well and build a new pump house. The City of Fairfax modified its storm sewer system using detention to lessen the impact of flooding. In Renville County, near the City of Olivia, the entry of rural runoff into the City storm and sanitary sewer system resulted in extensive damage to basements. BMI created plans for a system that would reduce the likelihood of this occurrence in the future. The project is currently in the County hearing process.

BMI engineers recommend a two-fold approach to reduce damage from heavy spring water flows. Duane Hansel of BMI explains, "I am impressed that we are working to better manage flood plains to reduce the potential of property damage. But structural improvements to infrastructure are also necessary, and BMI brings a strong combination of broad expertise and experience to the job." Bruce Firkins concurs, "Flooding is a problem even if you're not on a river. It's satisfying to identify specific sources of these problems and work with communities to create solutions."

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adding another benefit for the aquaculture process in recycling water.

According to Duane Herbert, Renville's City Administrator, "The City of Renville, as well as many other rural communities, were hit hard in the 1980's during the farm crisis. The whole point of this project and the creation of our industrial park is to reverse the trend of population loss. Communities are hard pressed to find new ways of forming partnership's

such as this project, to use resources in the most cost effective means to build our communities back up."

Bolton and Menk, Inc. assisted the City of Renville in the design and construction of the waste heat recovery system as well as several other projects which have been completed to make the industrial park even more attractive to potential occupants. An additional 4 miles of interceptor sanitary sewer has been

constructed and a 2 mile watermain loop has now been completed. In addition, a new water treatment facility and a 300,000 gallon water tower are under construction to meet increased water demands.

Sharing the same concerns as many smaller communities in declining population and community development, this mutually beneficial project hopes to promote both industrial and economic development for many years to come.

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