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Coordinated Effort, Federal Funding Spell Success for Rural Areas

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In these challenging economic times, many communities find it difficult to maintain their roads, sewer and water systems, and other infrastructure. Yet repair they must, for the work needs to get done.

A substantial sewer rehabilitation project recently completed in Houghton County, Mich., serves as a good example of how rural communities, with the help of federal funding, can work together to solve an expensive problem.

This project also showcases the advantages of employing a team of contractors under the direction of a prime contractor. Working in unison they were able to complete the project on time and under budget. Best of all, they accomplished their objectives: to reduce inflow and infiltration (I&I) and breathe new life into a worn out system.

Houghton County sits on a finger of land jutting into the pristine waters of Lake Superior. Its 36,000 residents are spread among approximately two dozen communities or townships throughout its 1,500 square miles.

In areas like this, it is difficult for individual communities to fund infrastructure projects by themselves. In the late 1970s, four communities banded together to form the Torch Lake Sewage Authority to develop a sewage system for the area, according to Fran Bessner, System Operator.

A total of 1,250 connections exist in a system serving approximately 3,000 people. It is a mostly residential area, with perhaps 80 or 90 businesses, Bessner says. The system consists of two sites: Lake Linden, with four lift stations and one pump station, and Tamarack City with two lifts and one pump station. (Tamarack also has two simplex pumps connected near homes that are left over from the 1970s). Lake Linden is designed to handle 110,000 gallons/day; Tamarack was built for 100,000 gallons/day. Both pump into settling lagoons.

A former copper mining area, many of the homes are more than 100 years old, Bessner says. Few if any have sump pumps, and all floor drains are connected to the sanitary sewer system. The water table is shallow in one section, resulting in mainlines running under water. In addition, the region averages more than 200 inches of snow each year, causing significant spring flows.

An I&I study in 1985 determined that many roof drains were connected to the sanitary lines. Over time, the Authority was able to eliminate a lot of those problems and get to a manageable situation. But the system was still pumping too much water.

The settling lagoons were experiencing high levels and were often near capacity, according to Jim Koskiniemi, Project Manager for U.P. Engineers & Architects Inc. of Houghton, Mich. The Authority's discharge permit was up for renewal, and Michigan's Department of Environmental Quality stated that no new connections would be permitted unless the Authority expanded the lagoons or removed additional I&I.

Complete Analysis Was First Step

Koskiniemi says his firm recommended televising the entire 80,000 feet of main line. A previous smoke test had identified some problem areas, but couldn't pinpoint the source of the I&I, he says. Televising showed that about 25,000 feet of main line needed work, in addition to a number of laterals and manholes. The original clay pipe was joined every three to five feet, providing many more potential problem areas. "We were able to really nail down where the leaks were and what had to be done to fix the system," he says.

In addition, U.P. Engineers installed meters to give officials accurate data on flows. The results showed that flow rates were about double what they should have been. In fact, Bessner says, on some days Lake Linden was pumping upwards of 200,000 gallons a day; Tamarack perhaps 170,000 gallons. During rainy periods, Lake Linden was pumping 500,000 gallon a day. They could handle it, Bessner says, but the pumps would run continuously for weeks at a time.

An analysis showed that relining was the most cost-effective of the repair options available, Koskiniemi says, so that's what the Authority chose to do. Visu-Sewer Inc. of Pewaukee, Wis., was the low bidder, and became prime contractor for the project. As was the case in the 1970s, the Torch Lake Authority turned to the USDA's Rural Development program for funding. They secured a low-interest, 40-year loan to undertake the rehabilitation. (For more on the Rural Development program, see the sidebar on page 27.)

One thing immediately apparent, says Phil Romagna, Vice President of Visu-Sewer, was the extensive deterioration of the mainline. "Quite a bit of the system, which was constructed of clay pipe, had simply failed," he says.

As prime contractor, Visu-Sewer needed to coordinate the efforts of several subcontractors. Included among those were Manderfield PHE Inc. of Atlantic Mine, Mich.; Southwest Pipeline and Trenchless Corp. of Gardena, Calif.; and Tony Burcar Contracting Inc. in Hubbell, Mich.