Room for the **Boom**

By Matthew J. Peleschak

Reducing flow with a lateral pipe-lining solution

Old Lycoming Township, located along Lycoming Creek, is a rural suburb of the city of Williamsport, Pa. It includes many single-family homes and an extensive stretch of commercial and light industrial development. The community developed as a result of the lumber boom from 1861 to 1891, which supplied wood that was used to construct many of the early homes on the East Coast. Today, a new boom is occurring.

ARTICLE SUMMARY

Challenge: During wet-weather events, Old Lycoming Township's sanitary sewer system experienced significant infiltration and inflow, robbing the system conveyance capacity.

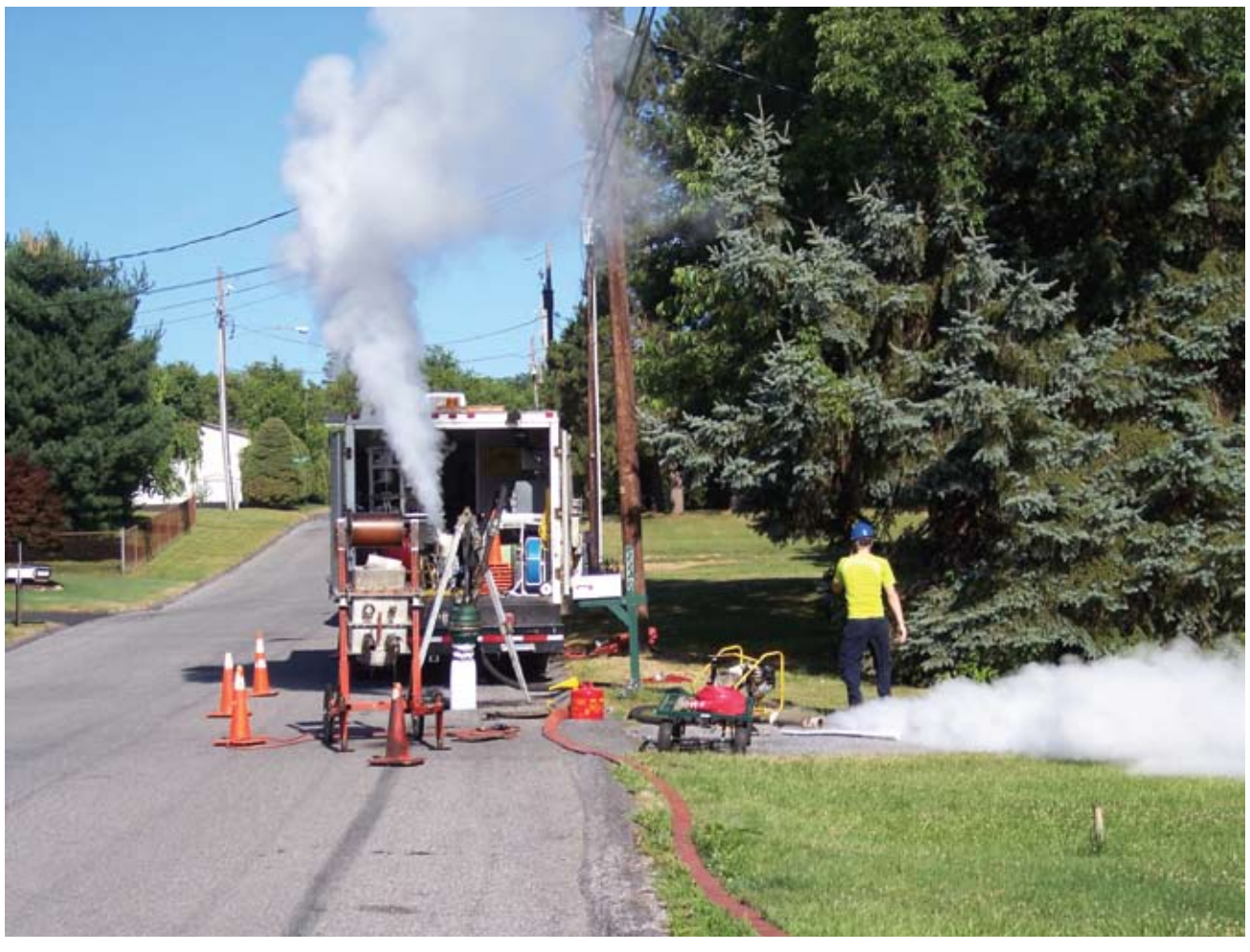
Solution: A study concluded that it would be necessary to rehabilitate 17,300 ln ft of pipeline and 58 manholes, as well as replace 1,800 ln ft of the system. A lateral solution in which both the lateral and the lateral connection at the sewer main can be lined with a single liner was chosen for the job.

Conclusion: One of the most neglected portions of the sanitary sewer system now is seamlessly rehabilitated. Four months into the project, the system has seen a noticeable reduction in flows.

Exploration into the Marcellus Shale, a rock formation that holds trillions of cubic feet of natural gas, is beginning to tax local infrastructure because of the influx of people and business related to its development. One of the community assets that is seeing increased pressure is the sanitary sewer system.

Old Lycoming Township's sanitary sewer system consists of approximately 29 miles of 8- to 21-in.-diameter collector and interceptor sewers and three pump stations. The system conveys sewage to the city's west wastewater treatment plant (WWTP). The sanitary sewer system consists of three major drainage areas, two of which were constructed in 2001 and 2006. The sewers in the Flexer Court Area, the third and largest drainage area, were constructed in the early 1970s. They are comprised of asbestos cement and vitrified clay pipe, with the manholes constructed of either brick or precast concrete.

During wet-weather events, this portion of the system experiences significant amounts of infiltration and inflow (I&I) that are robbing the system conveyance capacity and causing the township to exceed its allocated limit at the city's WWTP. Without addressing the condition of the Flexer Court Area, the township would limit its ability to capitalize on the economic development and growth of the Marcellus Shale boom.



Cleanouts included a storm sewer casing backfilled with select material and a cast-iron frame to prevent future damage.

I&I Action

In 2009, the Old Lycoming Area Authority (OLAA) authorized Larson Design Group (LDG) to complete a detailed study of the sanitary sewers in the Flexer Court Area. While the study had numerous recommendations for managing wet-weather flows, the two primary recommendations for addressing I&I at the source were:

1. Rehabilitating 17,300 ln ft of pipelines and 58 manholes that were identified as either structurally deficient or actively leaking, and replacing the 1,800 ln ft of the system constructed of vitrified clay pipe and brick manholes; and
2. Implementing a property inspection program that will inspect all properties connected to the system with the objective of identifying I&I sources from private properties.

It is difficult to cost-effectively remove I&I from an older sanitary sewer system by only rehabilitating sewer mains and manholes. Water eventually will find new locations—typically in laterals and private building sewers—through which to enter the system. Many utility owners do not tackle this portion of the system because they either do not have information concerning the condition of the piping or do not want to deal with the political backlash from implementing a property inspection program.

In 2010, the OLAA authorized LDG to obtain regulatory permits and approvals and prepared the construction contract documents, drawings and specifications for Sanitary Sewer Rehabilitation Project No. 1. Where practicable, trenchless technologies were utilized to minimize disruption and expedite construction. The project was bid in February 2011 and was awarded to HRI Inc. of Williamsport, a local excavation company, for $2.3 million. HRI subcontracted with two trenchless rehabilitation companies to complete the project: United Survey Inc. of Cleveland and Video Pipe Services of Newfield, N.J.

In addition to the public rehabilitation project, the township implemented a property inspection program

in 2010 for all properties connected to the sanitary sewer system. As part of the inspection program, the township investigated illegal connections and completed video inspections of the building sewers and laterals. Property owners were given the results of the inspection and required to remove all illegal connections and make any necessary repairs to their buildings' sewers.

Fixing the Laterals

As part of the project, rehabilitation of the lateral from just off the edge of pavement to the sewer main was incorporated to address migration of I&I into this portion of the system. The project included the installation of cleanouts and the trenchless rehabilitation of the lateral.

To facilitate the trenchless rehabilitation of the lateral from the main to the cleanout, cleanouts were installed at more than 150 laterals. This saved on expensive street excavation and restoration costs. Unlike today's standards, cleanouts were not regularly installed when the system originally was constructed. In specifying the construction of new cleanouts, a section of 15-in. smooth-bore, corrugated high-density polyethylene storm sewer pipe was utilized around the cleanout stack, which then was filled with bedding material. This strengthened the cleanout, which is one of the most break-prone areas of any sanitary sewer system.

Prior to backfilling the trench, a cast-iron cleanout lid was installed. This allowed cleanouts to be placed at grade, preventing lawn mowers from damaging the cleanout and providing a means for easily locating the cleanout with a metal detector.

Once the cleanouts were installed by HRI, United Survey lined the lateral pipe from the sewer main to the cleanout. While the specifications allowed for the use of separate lateral liners and lateral connection liners, United Survey proposed the MaxLiner Complete Lateral System (CLS), in which both the lateral and the lateral connection at the sewer main can be lined utilizing a single liner that uses 100% solid epoxy resins.

The sewer main lining installation.

The MaxLiner CLS is a lateral solution starting from inside the sewer main and continuing up the existing lateral for 30 ft or more. It provides continuous, extended-length lateral rehabilitation that can handle installations with 90-degree bends. It also gives the lateral connection joint area extra strength while unifying the lateral and mainline liners.

The goal of any trenchless project is to eliminate as many joints has possible. The MaxLiner CLS seamlessly rehabilitated one of the most neglected portions of any sanitary sewer system. Four months into the project, the system has experienced a noticeable reduction in flows. Post-construction flow monitoring will be performed after the project is completed in November 2011 to quantify the amount of room that has been made for the boom. WWD

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