PURE TECHNOLOGIES
9130 Red Branch Road
Columbia, MD 21045

ASSESSING SEWER FORCE MAINS

Pure Technologies provides innovative technology and engineering solutions to manage pressurized pipelines and specializes in condition assessment of sewer force mains.

WHY ASSESS A FORCE MAIN?

A significant percentage of the United States force mains have been in use for several decades and never been assessed or proactively managed. To safely rely on these pipelines, their condition should be periodically checked to ensure there are no locations susceptible to failure. In addition, many wastewater agencies are faced with EPA consent decrees that require condition assessment of force mains. As a result, many agencies are now faced with the daunting task of assessing their sewer force mains—a task that until recently was often not feasible due to operational constraints. However, Pure Technologies continues to improve technology and can now obtain a realistic assessment of a force main within the common constraints of most wastewater agencies.

CASE STUDY

Greater Lawrence Sanitary District (GLSD) utilizes a 72-inch diameter sewer force main that is their only means to transmit wastewater from a pumping station to their treatment plant. As a proactive measure, GLSD implemented a state-of-the-art management program for the force main, including condition assessment, pipe strengthening, and implementing a structural monitoring system.

The program identified two pipe sections that were in a state of incipient failure- one of which was located between an Amtrak rail line and the Merrimack River. GLSD strengthened these pipes and safely extended the service life of this major asset. As a result, GLSD has averted one (perhaps multiple) failures of the pipe.

Pure Technologies has implemented numerous programs like this to safely extend the service life of problematic pipelines while saving their clients millions of dollars by avoiding capital programs to replace/slipline major pipelines.
METHODS TO ASSESS FORCE MAINS

There is no single assessment technique or program that provides a comprehensive assessment for all types of force mains. The best assessment programs utilize a combination of non-destructive assessments and engineering science and judgment, including some of the following:

**SmartBall Survey**: Identifies leakage and pockets of trapped gas in a sewer force main. The pipe remains in service while the survey is performed.

**Wall Thickness Measurement**: Where pockets of trapped gas are detected, wall thickness is measured to determine if H2S corrosion is adversely affecting the pipeline.

**PCCP Assessment**: There are several tools for condition assessment and monitoring of PCCP mains (electromagnetic inspection, acoustic monitoring, visual/sounding inspections). These techniques can be deployed while a pipe is in service or out of service.

**Soil and Groundwater Sampling**: By sampling and analyzing soils and groundwater, the aggressivity of the environment surrounding a pipeline can be determined.

**Design Review**: By evaluating a pipe design to the standards when the pipe was constructed and to today’s standards, a pipeline’s durability can be evaluated.

**Test Pit Evaluations**: Through exposing the pipe for inspection and sampling, a detailed assessment can be ascertained for the points that are inspected.
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Since 1993, Pure Technologies has been providing non-destructive testing and monitoring technologies to better understand the condition of civil infrastructure, with a focus on pressurized water/wastewater pipelines. Pure provides inspections, engineering analysis/recommendations, condition assessment, non-destructive testing, and monitoring solutions for pressurized mains.

Pure has been providing condition assessment of pipelines since 1997 and has developed a reputation for honesty and integrity while improving the state-of-art for pipeline assessments. Some of the notable accomplishments of our company include:

- Provided assessment/inspection services for more than 2000 miles of pipe.
- Provided structural monitoring systems for more than 500 miles of pipe.
- Pure Technologies researches, designs and develops technologies and holds a number of patents on condition assessment techniques.
- Pure’s engineering subsidiary (Openaka, Inc.) has performed engineering evaluations of pressure pipe for more than 25 years.
- Pure has designed and oversaw isolated repairs of approximately 150 pipe sections.
- Performed pipeline sampling programs (soil, groundwater, mortar, pipe sampling, wall thickness measurement, etc.) on 16 projects.
- Performed pipeline forensic evaluations to determine the condition of a pipe or cause of failure/deterioration on 15 projects.
- Provided assessment/inspection services for more than 50 utilities throughout the North America and around the world (e.g. Canada, United States, Mexico, Taiwan, France, Belgium and the Great Man Made River Project in Libya).

(Left) Structural monitoring system implemented on a sewer force main; (Right) leak identified on a 36” cast iron main.