Case Study:
WASHINGTON SUBURBAN SANITARY COMMISSION

- Assess & Address™ Technology Driven Pipeline Solutions
- Acoustic Fiber Optic Monitoring
- Electromagnetic Inspection
- Leak Detection
- Pure Engineering Services
- 2007 – ongoing

Program Benefits

- Cost is roughly 6% of the capital replacement estimate of $2-BILLION
- 95% of pipes have no deterioration at all
- Less than 2% of pipe sections require immediate repair
- ZERO pipeline failures since 2007 on managed pipelines

Pipe Material | Inspection Length | Diameter | Transmission Type
--- | --- | --- | ---
PCCP | 145 miles | Greater than 36-inches | Water

“WSSC is using technology-driven solutions to extend the life of its critical transmission mains at a fraction of the cost of replacement of the assets. At a time when water and wastewater utilities are faced with increasing challenges maintaining aging infrastructure under severe budgetary constraints, this program serves as a model for responsible fiscal management. The expansion of the program is validation of this strategy and we are proud to work with WSSC on its execution.”

- Travis Wagner
Vice President of Engineering, Pure Technologies
The Washington Suburban Sanitary Commission (WSSC) is the 8th largest water and wastewater utility in the United States, serving over 460,000 customer accounts and 1.8 million residents in Montgomery and Prince George’s County, Maryland (suburban Washington D.C.). WSSC operates nearly 5,500 miles of water mains, with approximately 145 miles comprised of large-diameter Prestressed Concrete Cylinder Pipe (PCCP) equal to or greater than 36-inches in diameter.

PROBLEM:
After WSSC began experiencing major PCCP failures in the 1970s, it developed a strong commitment to infrastructure management technology in favor of large capital replacements. Beginning in 2007, WSSC and Pure Technologies began a partnership to create a comprehensive PCCP management program. Pure’s Assess & Address™ approach to pipeline management is built on extensive research and data from over 8,000 miles of pressure pipe inspection which has found that less than 1 percent of pipelines need immediate repair. Assess & Address programs focus on identifying vulnerable areas of a pipeline and completing selective rehabilitation and replacement in favor of full-scale capital replacement, often saving the utility millions of dollars.

SOLUTIONS:
Pure Technologies uses several solutions for WSSC’s PCCP management program that effectively inspect the pipeline for leaks, gas pockets, and structural deterioration. Pure also provides real-time monitoring of the pipelines to alert the WSSC when individual pipe segments experience prestressed wire breaks and are approaching a high risk of failure. Pure’s SmartBall® Acoustic Leak Detection Technology is used to identify leaks and pockets of trapped gas, allowing for proactive repair. The SmartBall inspection tool is a non-destructive, free-swimming technology that measures the acoustic activity associated with leaks and gas pockets in pressurized pipelines. Early identification and repair of leaks and gas pockets reduces water loss and structural deterioration and is crucial in understanding the baseline condition of a pipeline. Pure Technologies regularly deploys SmartBall leak detection as part of the program having identified several major transmission mains leaks within WSSC’s system to date.

WSSC Pipelines are also inspected for structural deterioration using several of Pure’s platforms. Manned visual and sounding inspections of deteriorated pipes help identify visible structural damage like corrosion, delamination, and cracking. Pure also uses PipeDiver® and PureRobotics® Electromagnetic (EM) Technology Platforms to locate and quantify broken prestressing wires in each pipe section. The PipeDiver tool is a free-swimming technology with EM sensors on each fin that take readings as it travels through the pipeline with the water. It is able to quantify the amount of wire breaks in PCCP and is the best method of determining a baseline condition of a PCCP pipeline that cannot be removed from service. The Pure Robotics platform is an EM inspection tool used when a pipeline cannot be dewatered or the diameter is too small for a manned inspection. The tool contains a CCTV camera, SONAR, and EM sensors and takes a magnetic signature reading inside the pipeline and quantifies the amount of wire breaks using electromagnetics.

Pure Engineering Services (PES) and WSSC combine the information from these inspection techniques to provide actionable information (including structural modeling and analysis), which allows WSSC to safety manage their PCCP inventory while minimizing repairs and replacements. In addition to regular condition assessment, WSSC began using Acoustic Fiber Optic (AFO) monitoring in 2007, and by the end of 2012 will reach over 70 miles of monitored PCCP. Ultimately, the program will monitor up to 145 miles of 36-inch and larger PCCP within WSSC’s system. AFO technology monitors the condition of PCCP by tracking the amount of wire breaks in each pipe section. The system allows WSSC to monitor pipeline deterioration and see at-risk pipes before they fail. As wire breaks occur, the data is analyzed and reported to WSSC by e-mail and advanced GIS and web-based reporting systems, allowing for real-time management of WSSC’s system.

RESULTS:
While WSSC’s PCCP program is one of the largest and most advanced infrastructure management programs in the industry, the cost of Pure's Assess & Address model is roughly 6 percent of the $2-billion capital replacement estimates. To date, Pure’s inspections have shown that about 95 percent of WSSC’s pipes are in “like new” condition and less than 2 percent require any immediate rehabilitation or replacement. By identifying and selecting distressed areas, WSSC was able to avoid a full replacement program and avoided massive capital replacement costs by rehabilitating the identified sections. Since the program’s inception, no PCCP failures have occurred for any transmission main managed under the program.