

Same day return to service

Bitumen lining removal and application of water quality lining in 1960's era cast iron water pipe in Saint John, New Brunswick

BY BRIAN THOROGOOD, P.ENG

In September 2013, the Tomahawk pipe cleaning system by Envirolitics Engineering Inc. played a key role in a successful, same day return to service, 6" cast iron water main rehabilitation project in Saint John, New Brunswick. Tomahawk was required to remove the internal corrosion buildup and old bitumen liner to ensure the long-term bond and leak-free performance of the applied spray in place pipe (SIPP) liner.

Trenchless Solutions from Moncton, New Brunswick, was the general contractor and has several years of experience cleaning and lining deteriorated metal water mains. Trenchless Solutions is a certified applicator of the 3M Scotchkote Pipe Renewal Liner 2400 product. 3M representatives were also on site to evaluate Tomahawk's performance as this was their first exposure to the method.

“The Tomahawk System proved its capability to remove pre-existing, internal, bitumen coating from cast iron water mains. The process left behind a clean, dry pipe that enabled a successful application of 3M Scotchkote Pipe Renewal Liner 2400.”

Shawn Sweeney, 3M Water Infrastructure Solutions

The Saint John project was a part of an annual program to renew its water distribution pipe network. The project called for the application of a water quality lining to restore the pipe's hydraulic capacity, improve water colour and taste, and to prevent future corrosion. During



the course of the project, a 435' section of pipe was discovered to have an old bitumen liner after initial cleaning. An attempt was made to remove the bitumen but was not successful.

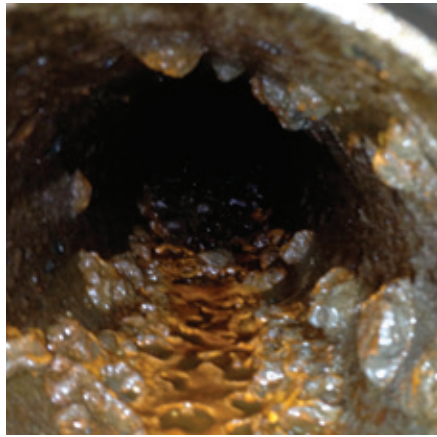
Trenchless Solutions then contracted Envirolitics to remove the bitumen from the 435 foot pre-cleaned pipe along with a second 357 foot section. Once on-site, Tomahawk quickly removed the corrosion and bitumen from the 435 foot pipe in 2 ½ hours. The pipe was left in a clean and dry state, ready for lining. The results generated excitement by those watching including a lining crew member who

claimed this to be “the cleanest pipe” he had ever seen.

On the following day, the 357 foot section was cleaned by Envirolitics in under 3 ½ hours. This pipe had not been pre-cleaned thus requiring both tuberculation and bitumen removal. This pipe was cleaned and lined under “same day return to service” conditions as no service bypass was in place. The water main was taken off line, cleaned, inspected, lined, flushed and reinstated by evening under a “boil water advisory”. The advantages of same day return to service include lower project cost and timing along with a significant



Left: 6-inch, 435 foot CI pre-cleaned pipe prior to Tomahawk cleaning, corrosion and bitumen seen. Centre: pipe after Tomahawk cleaning including removal of loose graphic corrosion, light gray sites. Right: after pipe lining by Trenchless Solutions.



Left and centre: 6-inch, 357 foot CI water main prior to Tomahawk cleaning. Right: same pipe after cleaning.

reduction in the duration and amount of street level disruption.

City of Saint John staff members expressed their approval for several of Tomahawk's features. The system is closed meaning no internal pipe deposits are exposed to the public and all waste is captured for ease of disposal. The process is a dry cleaning method eliminating non-revenue water consumption and disposal of wet waste. Envirologics' Tomahawk Scout is an airstream driven, CCTV camera with an integrated abrasive deflector and was deployed to target clean remaining patches of bitumen in real time, much to the delight of the viewing audience. This is the only known process to effectively remove bitumen from water mains eliminating the expense of dig and replace.

“The Tomahawk is an effective trenchless system that quickly removes tuberculation and bitumen lining from cast-iron pipes. The pipe is left clean and dry, ready for lining.”

John Campbell, City of Saint John Engineering

Trenchless Solutions was also pleased with the cleaning results. The pipe was left dry without the need for extensive swabbing. The Scout was again deployed to aerodynamically draw out debris and water from joints and service connections.

The joints and service connections were left undamaged and the quality of lining was superior due in part to how clean and dry the pipe was left.

This project was validation of Tomahawk's capability to remove tuberculation and bitumen from cast iron water mains in a “same day return to service” environment. Envirologics believes there is a large market for cost effective, water quality, non-structural liners. Cast iron and steel pipes which have been protected by bitumen liners are often in excellent condition and do not require a more expensive, structural solution. The ability to rehabilitate and return the water main to service in the same day will only increase the market opportunity.

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