



## TO LINE OR NOT TO LINE, THAT IS THE QUESTION.

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As our country's infrastructure continues to deteriorate and replacement costs continue to climb it is time to look at alternatives. Although there are many, I will focus on concrete lining in unlined cast iron pipe. "The oldest cast iron water pipes date from the 17th century and were installed to distribute water throughout the gardens of the Chateau de Versailles." (Wikipedia) Eighty-five percent of these pipes are still in service.

Recently I visited a Southern Tier community that was having an issue with roily water and maintaining a chlorine residual in a section of their town. A daily flush was being done to maintain a residual. I met with the Chief Water Operations Specialist to look at the area. It felt like I was driving through the streets of the village where I once held this job title. Years ago, a subdivision in my home system had the same issue. Whenever there would be a reverse flow, there were numerous roily water calls. The main in question was a combination of unlined 10" cast iron from the 1930's feeding the elevated tanks and a 6" unlined cast iron from 1950 in the distribution area.

"Corrosion of cast-iron-pipe can occur on both the internal and external surfaces. In electro-chemical corrosion, internal anodes develop where bare iron is exposed to aggressive waters, promoting iron to move into solution. The iron combines with various components in the water, forming a tubercle on the pipe interior. This process of tuberculation can eventually cause significant restrictions in the cross-sectional area within the pipe. Since the tubercles are irregularly shaped, buildup of bacterial growths on the surface are likely. As more iron moves into solution, the result is a loss of pipe structure over time potentially affecting pipe integrity." (Wikipedia)

In my home system fire flow calculations were done to help determine the extent of tuberculation. A dead-end hydrant, on a 6-inch CIP main, gave us a maximum flow of 250 gpm. A spot was chosen, and a profile section of pipe was examined, our 6-inch pipe looked more like a very rough 4-inch pipe on the inside. Specs were written, bids were submitted, and a contractor was chosen. The water department was to install and maintain all of the temporary piping and connections and do all of the excavation and restoration. The main was scoured, swabbed, then a camera was run through, after which the lining began. A grout trowel was pulled through from section to section. After curing, each individual curb stop was opened to remove the grout from the corp. When done, the tee's, valves, and hydrants were all replaced.

The main was chlorinated, flushed and sampled before going back in service. A follow up fire flow was done, and the same dead-end hydrant would now flow 900 gpm.



Why not just replace the main? Replacement cost was much higher. Infrastructure in place would not allow for required utility separation. Restoration was minimal compared to full replacement.

My recommendation to this small community is main lining. I hope my experience with a like issue can help them find the best solution for theirs... providing **Quality on Tap!**

I hope to see you in my travels. 💧💧

