



# TRI-STATE UTILITIES TAKES ON NEWMARKET PLAZA AREA SEWER REHABILITATION PILOT PROJECT

## Successful CIPP Main & Laterals Project One of Three Pilots Navigating Future Course for Area Wide I&I Reduction Program in Hampton Roads

By: A2B Publishing Inc.

*Tri-State Utilities installs mainline CIPP, Newmarket Plaza Area*

Headquartered in Chesapeake VA, Tri-State Utilities has, in over 25 years of work rehabbing sewers and storm drains, earned a solid regional reputation for strong technical expertise in trenchless utility rehabilitation, continuing the tradition set by company founder Steven F. McSweeney. An accomplished underground contractor, Tri-State earned the National Utility Contractors Association National Safety Award, and received local recognition as the Hampton Roads Utility & Heavy Contractor Association Contractor of the Year for both 2000, and 2008.

Employing over 65 people, Tri-State is well versed in the latest trenchless technologies, having garnered a wealth of experience on multiple projects trenchless pipe lining with CIPP. Cured-In-Place Pipe (CIPP) has

become the time proven application for rehabilitating sewers and storm drains known for its versatility because each liner is custom engineered and manufactured, precisely fitting the host pipe. CIPP liners have become an industry standard and were the choice for a sewer rehabilitation project in the Newmarket Plaza Area residential development in Newport News, VA. Earlier work had shown lining pipe in this area was feasible.

HRSD, the regional wastewater authority, was undertaking the “Locality System

Monitoring and Condition Assessment” pilot project to rehabilitate the Newmarket Plaza Area sanitary sewers and laterals as part of a major, area wide program to minimize Inflow and Infiltration (I&I). Once complete, the Regional Wet Weather Management Plan (RWWMP) will set out a program to reduce frequency and severity of Sanitary Sewer Overflow (SSO) events during rainstorms. It has to be ready in time for an October 1, 2017 deadline to comply with an Environmental Protection Agency (EPA)

***“TO MEET OUR FEBRUARY COMPLETION DEADLINE WE CLOSELY MANAGED THE DAILY WORK OF AS MANY AS 6 CREWS, WITH 4 OF THEM BEING SUBCONTRACTORS ALL ON SITE AT ONCE.”***

and Virginia Department of Environmental Quality (DEQ) Consent Decree (CD), so the entire multi-phase process is on a relentlessly tight schedule.

This Design-Bid-Build project was important because it was one of three pilots that were going to be used to evaluate the most effective construction delivery methods for the entire regional program, refining and

improving processes in preparation for a roll out of future local area I&I reduction projects under the RWWMP. By helping identify the most cost efficient and effective methods, the results and lessons learned from the initial three pilot projects would guide the approach for the future rehabilitation projects coming down the pipeline.

Tri-State Business Development Manager,

John Saintsing explains, "Using trenchless CIPP, our goal always is to provide good services and meet the needs of our customers while improving the environment. With the Newmarket Plaza pilot project, we took on a challenge to keep to our high standards while completing the work on the tight schedule required by HRSR. It was important - we knew we could be helping set a standard and blaze the trail for how future projects under the regional wet weather management plan would get done..."

Raising the bar a little higher, the project required Closed Circuit Television (CCTV) inspection of laterals to assess them for rehabilitation or replacement during construction work on the mains. This required close and careful coordination and staging of work among the subcontractors and crews on a tight work site and schedule.

As Saintsing noted, "To meet our February completion deadline we closely managed the daily work of as many as 6 crews, with 4 of them being subcontractors all on site at once."

The deadline was crucial. Successful on-time completion of the Newmarket Plaza



Wetlands in Hampton Roads



**Utility Rehabilitation Specialist**  
***SSES Field Services***

- Pipe Cleaning / CCTV Inspection
- Smoke & Dye Testing
- Laser Profiling / Digital Scanning
- Mainline, Manhole, & Lateral Inspections
- CIPP Sectional Liners
- Mechanical Spot Repairs



***Trenchless Technologies***  
**CIPP (Cured-In-Place Pipe)**

6" – 96" Diameter  
NCDOT Approved • VDOT Approved

2111 Smith Avenue • Chesapeake, VA 23320



**Telephone: (757) 366-9505 • Fax: (757) 366-5150**

**[www.tristateutilities.com](http://www.tristateutilities.com)**

Area project by Tri-State was an important step forward in the overall effort being made by HRSD to reduce SSO events.

## HRSD

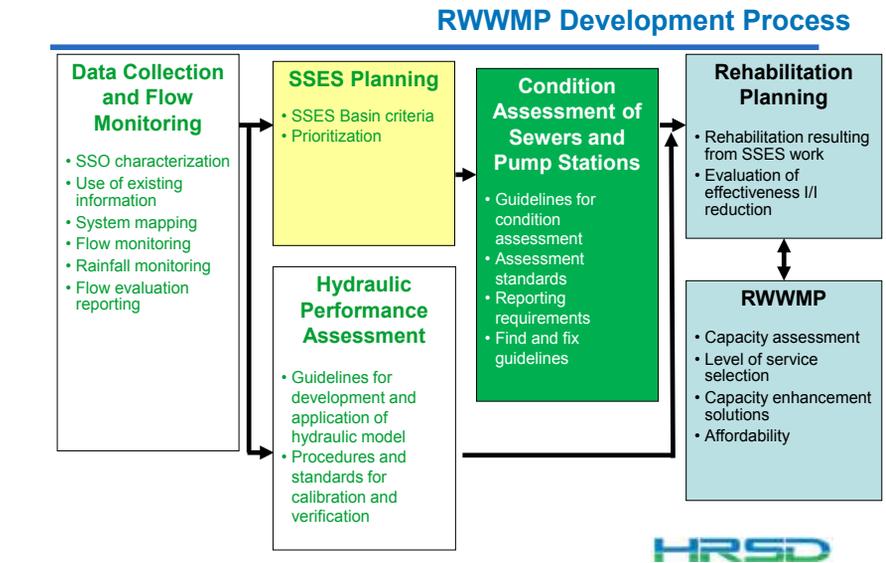
HRSD takes environmental protection very seriously and has an exceptional record of permit compliance. HRSD serves 17 cities and counties in southeastern Virginia, an area with a population of 1.7 million spread over 2808 square miles. The HRSD regional and local sewer networks comprise an extensive system within the coastal tidewater area surrounding Hampton Roads. The area has sensitive estuarine and coastal ecosystems, wetlands adjoining urbanized areas, port and military facilities. Drainage, especially during frequent wet weather events, is an ever-present challenge.

HRSD operates over 500 miles of sewer, primarily large diameter force mains, along with 112 pump stations, conveying wastewater to 13 treatment plants. In total, the connected local sewer systems comprise a collection network of 7,000 miles, over 80% gravity sewer. The system has overall capacity to treat 249mgd and carries on average 165mgd wastewater to the treatment plants.

The HRSD system only handles wastewater intake from the localities. Each of the localities, including Newport News, has a separate system for handling storm water runoff; however during wet weather the local sanitary sewer systems can become flooded due to groundwater infiltration and from the inflow of storm water entering through



HRSD operates 13 treatment plants



manholes, cracked pipes and clean outs. This I&I from the local systems can overwhelm the capacity of the regional HRSD system, causing releases of untreated sewage into the surrounding environment. SSO events documented by HRSD have averaged 40/year over the past decade, ranging from a low of 15 occurrences to a high of 90. There needed to be a system wide organized response, so in 2010 HRSD negotiated a Consent Decree with the EPA embarking on a comprehensive program aimed at reducing SSO occurrences.

### Locality System Monitoring and Condition Assessment

After the Consent Decree, necessary investigations, data collection, flow monitoring and condition assessment work followed to determine the problem locations. There had been previous I&I mitigation efforts and rehabilitation work performed in both the regional system and the localities; however a more comprehensive and systematic region wide approach was now mandated.

Because this investigative work confirmed the local sanitary sewer systems were a major source of I&I entering the regional conveyance system, HRSD entered into cooperative agreements with 14 local governing bodies. Assuming control over I&I improvements in all local collection systems, HRSD took responsibility for the funding and implementation of a regional plan of action, the

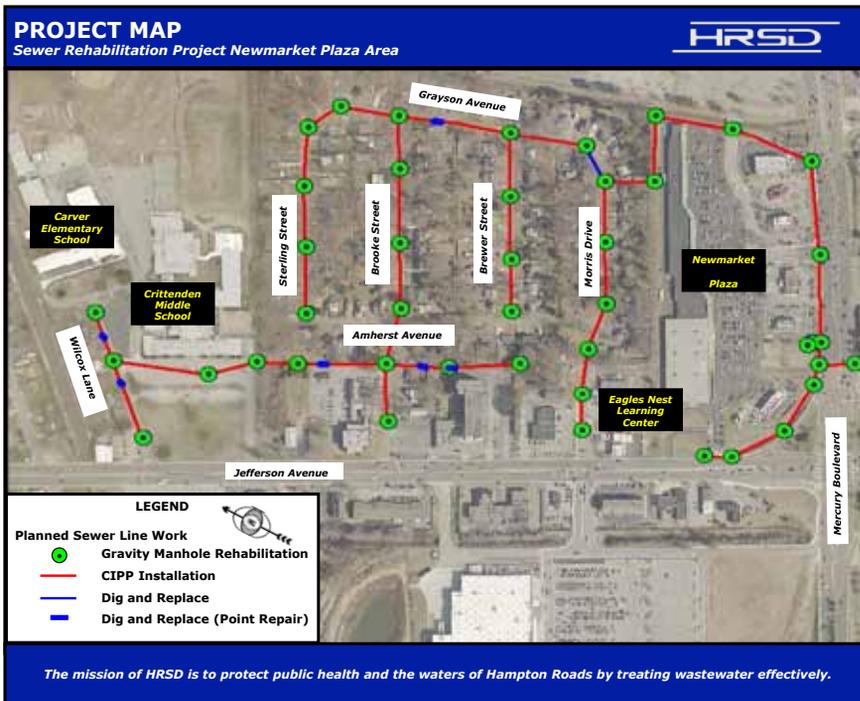
RWWMP, which would define an achievable level of service capacity management.

HRSD then did Sanitary Sewer Evaluation Surveys (SSES) in just over 110 priority basins. From past SSES work performed by the localities, and these HRSD priority basins, HRSD studied 450 priority sewer basins in the local systems. The work included pipe inspections, smoke and dye testing and flow isolation studies to measure the quantity of groundwater infiltration in dry weather. Investigations eventually narrowed the focus to 287 basins with significant I&I measurements. These are the immediate priority for rehabilitation projects in the RWWMP program.

### Three Important Pilot Projects Setting the Course

Out of the 287 sewer basins identified as needing immediate attention, three basins were selected as pilot projects for immediate rehabilitation work, two in Virginia Beach (Basins #111 and #340), and the Tri-State Newmarket Plaza Area job in Newport News (Basin#008). All three pilot projects will help assess future options for work on the sewer basins identified as significant contributors of I&I. They will assist HRSD in evaluating how different methods will best fit the future projects anticipated in the RWWMP – essentially a process of figuring out the best tools for the tool kit.

The Newmarket Plaza Area job examined



the effectiveness of the traditional Design-Bid-Build construction method – Tri-State was the successful low bidder and was the General Contractor (GC). The other two pilots looked at alternative Design-Build and Unit-Price project delivery methods. The work on all three focused almost exclusively on rehabilitation or replacement of public assets – pipes, manholes and public sewer laterals, with a small amount of work on private laterals required in the Unit Price project (Basin #111). All three were in similar mixed residential and commercial neighborhoods.

With the push to complete the RWWMP on time, all three pilot projects were on a very tight schedule. Design work on all three occurred through summer 2015; construction began on the two Virginia Beach jobs in September 2015 and finished in December. Work commenced on the Newmarket Plaza October 2015, with completion February 2016. Each pilot project had a specific quantified target for I&I reduction, to be assessed after completion.

### Design-Bid-Build CIPP Pilot

The goal for the Basin #008 Newmarket Plaza pilot was reduction of I&I intrusion by 70%.

Work was located completely within public property, extending to roughly 10 feet from the edge of the pavement. The project as designed entailed: CIPP of 9,754 LF of 6 to 12-inch gravity sewer main; replacement of 300 LF of 8 to 10-inch gravity sewer main; rehabilitation of 42 gravity sewer manholes totalling 300 VF; replacement of 3 gravity sewer manholes; CIPP of 94 LF gravity sewer laterals; and replacement of 48 gravity sewer laterals. CIPP lining work needed to be completed in a narrow time window, and during the mid-Atlantic stormy months.

Appropriately, the local Newport News office of Whitman, Reardon & Associates (WR&A) did the design and engineering for Tri-State’s CIPP project. Now in its 101st year, WR&A has a history of experience and familiarity with the Newport News sanitary sewer system. From 2009 - 2012, WR&A performed SSES condition assessment work in the central portion of the city including inspection of nearly 3500 manholes. WR&A gathered this data for use in developing sewer rehabilitation plans in compliance with the Consent Decree, and worked closely with city staff to identify sources of I&I, such as laterals, suitable for the “Find & Fix” approach mandated under the program.

The WR&A lead Engineering Consultant for the project, Scott Kenney, P.E., remarked “With the goal of reducing I&I, HRSD and WR&A focused on the addressing sewer laterals, acknowledging they are critical locations where I&I is prone to entering the sewer system.”

### “Find and Fix” Approach Yields Results – Mains & Laterals

By their nature and sheer quantity, laterals can provide numerous points of potential intrusion, and are an important element to consider in a comprehensive I&I reduction program. CCTV inspection of the public owned portions of the sewer laterals for immediate rehabilitation or replacement as construction proceeded was an integral aspect of the Newmarket Plaza Area pilot project design.

As Kenney noted, “Rehabilitation of sewer laterals was based on a find and fix approach. Each lateral was CCTV inspected during construction. Based on condition of the lateral, it was repaired using CIPP or replaced. The intention of this project was to line all laterals and replace where existing conditions prevented lining such as offset joints, roots, fracturing, or other defects.”

With as many as 6 crews, 4 of which were subcontractors, on site at any given time, this “find and fix” approach required close coordination, work sequencing and teamwork along with use of innovative new technology. Tri-State Project Manager Jonathan Thomas P.E. was instrumental in making sure the job stayed on track and on schedule. He worked closely with Kenney and HRSD Project Manager Matt Poe P.E. in

CCTV inspection of laterals during construction





Lateral CIPP installed in bladder system, assembly placed in manhole



recommending rehab options and coordinating work with all the crews.

Showing a willingness to explore new methods and equipment, Tri-State for the first time used the new Rausch Lateral Launch System to inspect the public laterals. CCTV inspections from the Lateral Launch System helped incorporate the “Find and Fix” element into the process while keeping the project on track to achieve deadline. As Saintsing described it, “The Lateral Launch CCTV let us assess for rehab or replacement right on site. It got us as far up into the laterals as we needed to look, even into the transitions.”

In 6 weeks, from January into February, laterals subcontractor BLD Services lined an impressive 94 laterals. Twenty of the laterals

had transitions from 6-inch to 4-inch, which required either transitional liners or installation of new cleanouts.

### Future with CIPP – Tri-State Utilities

With sewer laterals and manholes lined or replaced by end of February, and the mainline CIPP work completed in January, Tri-State successfully achieved the tight construction window while delivering their traditional high quality of work. Flow monitoring is now in place to assess the actual level of I&I reduction and post construction CCTV inspections are under review. Though measurement of results is preliminary, there are very good indications

it is a successful effort with strong likelihood of attaining the target 70% I&I reduction. Tri-State’s success on this CIPP pilot project is a key step in the actualization of the RW-WMP into an area wide program of sewer rehabilitation projects curtailing SSO events.

Benefits for the surrounding environment and community of using the trenchless CIPP method were present: disruption was minimal, traffic flow maintained throughout the project. All the work was within public right-of-ways, mostly using trenchless CIPP applications, with relatively little need for open-cut replacement of pipe and laterals. As expected, the impacts on the Newmarket Plaza neighborhood from the sewer rehabilitation project were negligible.

Scott Kenney feels Tri-State met the challenging schedule, kept their high standard:

“Tri-State Utilities and their subcontractors - BLD, D&S, and Basic Construction - did a great job. They had a very tight timeframe for completing this project and met all deadlines while still providing quality work – they busted their humps to get it done.”

HRSD is moving ahead with the RW-WMP. Given this impetus, the lessons learned from the integrated trenchless approach taken by Tri-State Utilities on the Newmarket Plaza Area project could serve as the standard for years to come. As Kenney summarized:

“This project was successful in rehabilitating an aged gravity sewer system with an emphasis on using a trenchless technologies first/ dig second approach. This mindset will pave the way in keeping up to speed with emerging trenchless technologies for future rehabilitation of aging sewer systems.”

### Key Project Personnel:

- Tri-State Utilities: John Saintsing, Jonathan Thomas P.E.
- Whitman Requardt & Associates: Scott Kenney P.E., Andy Landrum P.E., Lukas Terry,
- Hampton Roads Sanitation District: Phil Hubbard P.E., Bruce Hussenbee P.E., Matt Poe P.E.
- BLD Services: Nick Hollabaugh



Steam curing. Community impacts were negligible