

**CASE  
STUDY**



**PROJECT  
SNAPSHOT**

**PROJECT**  
Philadelphia Water Department

**CONTRACTOR**  
Vortex Services - Mid-Atlantic

**PROBLEM**  
Philadelphia's aging combined sewer system was causing roads to settle and flood frequently and was affected by excessive I & I.

**SOLUTION**  
Cleaned and inspected 30,220 LF of combined sewer pipes using CCTV technology. Installed 20,700 LF of CIPP and rehabilitated 2,275 VF of manholes. Utilized EnviroCure®-Felt (from United Felts) styrene-free Felt liners in multiple locations.

**CONTACT**  
Cory Twibell  
coryt@vortexcompanies.com

# Trenchless Sewer Rehabilitation Featuring EnviroCure®-Felt CIPP liner in Philadelphia, PA

**CITY LOOKING FOR CIPP LINING SOLUTION WITH LESS STYRENE EMISSION AND ODOR.**

**VORTEX  
PRODUCTS  
USED**

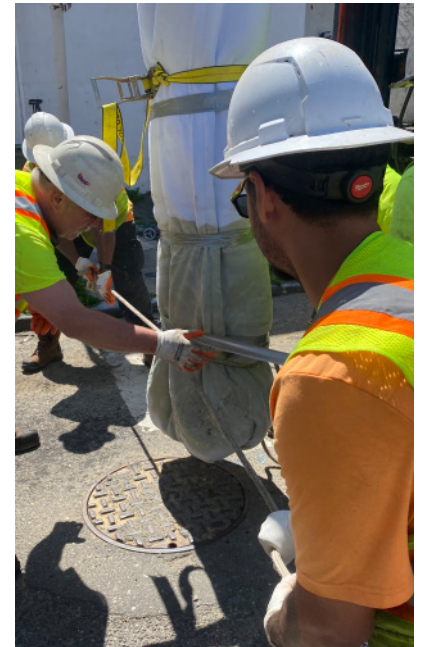
 **EnviroCure®-Felt**  
From United Felts, A Vortex Company

## THE CHALLENGE

In 2023, the Philadelphia Water Department (PWD) identified numerous problem areas stemming from the city's aging sewer systems. These issues included roads that were slow to drain and easily flooded, areas where pavement was starting to settle, and places where dye tests had revealed the presence of significant inflow and infiltration (I & I). Philadelphia's sewers mainly consist of elliptical brick-and-mortar combined sewer pipes and manholes, which are less commonly built today due to the risk they pose of combined sewer overflow events (CSOs). Vortex Services was awarded the trenchless rehabilitation contract with PWD because of its reasonably-priced bid.

## THE SOLUTION

As part of this comprehensive sewer rehabilitation project, the crew performed a wide range of services including mainline grouting, cured-in-place pipe (CIPP) repairs, spin-cast lining of sewers and manholes, and point repairs. The project's two point repair jobs were both executed in pipe 8" in diameter. Overall, the team rehabilitated 2,275 vertical feet of manholes, cleaned and inspected 30,220 linear feet of pipe using CCTV, and installed 20,700 linear feet of EnviroCure®-Felt CIPP liner.





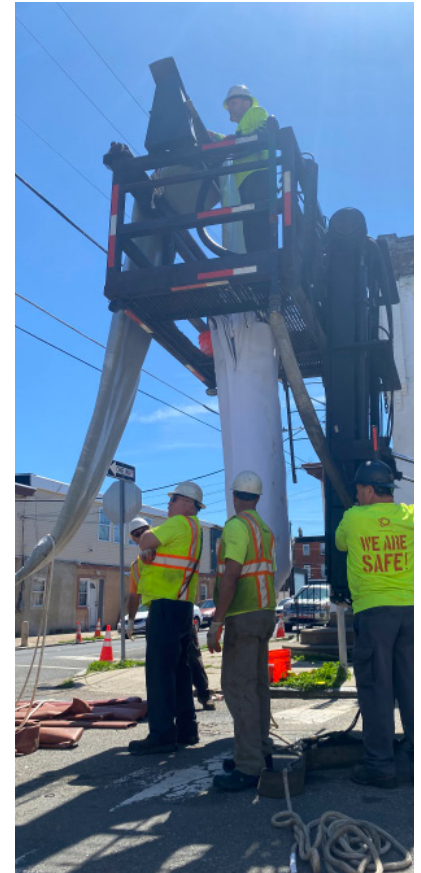
## CASE STUDY



The unique aspect of this project was the city's requirement of using styrene-free, "green" resin for all liners that were to be installed. This requirement came about due to odor concerns from previous rehabilitation projects, all of which utilized standard polyester resin with styrene. Due to the supply chain and installation/curing challenges of styrene-free resin, Vortex Services instead proposed the use of EnviroCure®-Felt from United Felts. EnviroCure-Felt, a polyester felt liner that features a multilayer coating specifically designed to minimize styrene odors (essentially creating a styrene barrier), would mitigate both styrene emissions and the associated odors. PWD agreed to pilot EnviroCure-Felt in five locations and, after witnessing its successful installation, agreed to substitute the product in lieu of the contract's originally specified material.

### THE RESULTS

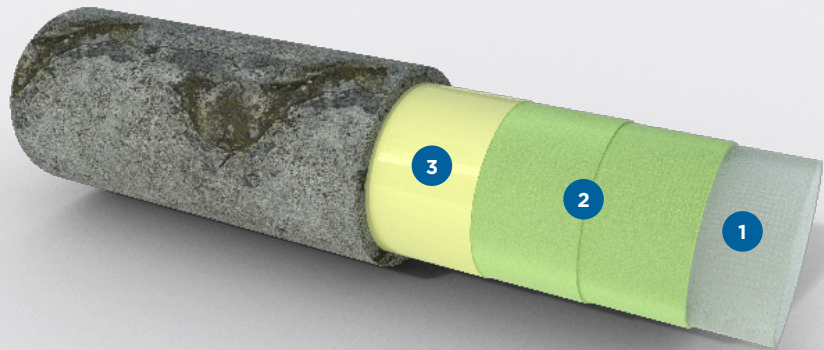
While this project is still ongoing, PWD has been satisfied with the Vortex Services team's hard work thus far. PWD has noted a significant decrease in odor complaints from its customers and Vortex Services has been pleased to be able to be a consistent presence in Philadelphia to continue to tackle the area's specialized infrastructure rehabilitation needs.



### ANATOMY OF ENVIROCURE FELT LINER

Features multiple layers of material, which are overlapped to reduce styrene odor and emissions. This multi-layer construction consists of:

1. Inner Felt Layer - With Styrene Barrier Coating
2. Felt Liner Layers - Resin Saturated
3. Pre-Liner - Optional



### IMPACT

**1** Used styrene-free, "green" EnviroCure®-Felt liners for all lining work.

**2** Rehabilitated problem areas, including sewer mains and manholes, in Philadelphia's combined sewer system.

**3** Caused a noticeable decrease in odor complaints from PWD's customers due to Vortex Services' use of EnviroCure®-Felt liners.