

# ENGINEERING THE EMPIRE

*Santa Ana Watershed Project Authority brine line rehabilitation by pressure CIPP*

## Overview

The Inland Empire Brine Line, constructed over two decades beginning in the 1970s, is an indispensable resource for the Santa Ana Watershed Project Authority (SAWPA). The line redirects salty industrial wastewater away from the local treatment plant and the Santa Ana River overland to the ocean.

A brine spill was reported near the intersection of Temescal Canyon Road and Cabot Road in the city of Corona in October 2011. Subsequent excavation of the 24-inch PVC IPEX Centurion DR 51 brine line in this location revealed a longitudinal crack along the invert through a joint. Though the pipeline had an internal pressure rating of 80 pounds per square inch (psi), it failed at an estimated pressure of 34 psi.

In September 2012, SAWPA convened a panel of experts who evaluated the pipeline condition and recommended the use of cured-in-place pressure pipe (CIPP) to repair the existing PVC pipeline. Following the initial formal bid process in 2014, the low-bid contractor backed out. SAWPA rebid the project utilizing a performance-based specification. However, a second contractor installed gravity CIPP which did not pass quality tests or satisfy specification requirements.

SAWPA then initiated negotiations with Insituform to complete the project. Effective communication was key to success on this project. Risk factors to overcome included installing a CIPP liner that could meet the pressure requirements and temperature limits of the existing PVC pipeline, especially given that conventional CIPP is not designed to handle pressure loading and typically employs a highly exothermic resin with cure temperatures that potentially exceed 300°F.



Deflected 24-inch PVC brine line was temporarily rounded using a megalug fitting. Installation of the InsituMain® CIPP permanently rounded and stabilized the PVC pipe.

## Pipeline Details and Project Summary

<b>Project:</b>	Santa Ana Watershed Project Authority Brine Line
<b>Location:</b>	Santa Ana, California
<b>Project Dates (start to finish):</b>	2017
<b>Pipe Length:</b>	11,000 feet
<b>Pipe Diameter:</b>	24-inch
<b>Existing Pipe Material:</b>	PVC
<b>Type of CIPP used for Rehab:</b>	Pressure with epoxy resin
<b>Installation Method:</b>	Inversion
<b>Longest Pull:</b>	500-foot average shot length
<b>Pressure Rating:</b>	60 psi
<b>Owner:</b>	Santa Ana Watershed Project Authority
<b>Engineer:</b>	Dudek
<b>Affiliated Contractors:</b>	WEKA, Inc. and Insituform

Insituform successfully completed the project utilizing a combination of InsituMain® CIPP reinforced with glass fiber and Elantas epoxy resin that resulted in no exotherm during the curing process. Due to the success of the installation, the original scope of 6,800 linear feet of 24-inch pipe was increased to 11,000 linear feet, allowing SAWPA to put this critical environmental asset back to work for the Inland Empire.

“Given all my years at Insituform, I knew we would have major hurdles to overcome by taking on a project after two other contractors. We understood these challenges and maintained excellent communication between all parties—which was key. I could never have imagined the project would go as well as it did. The pipe passed all tests and our original scope almost doubled in size.”

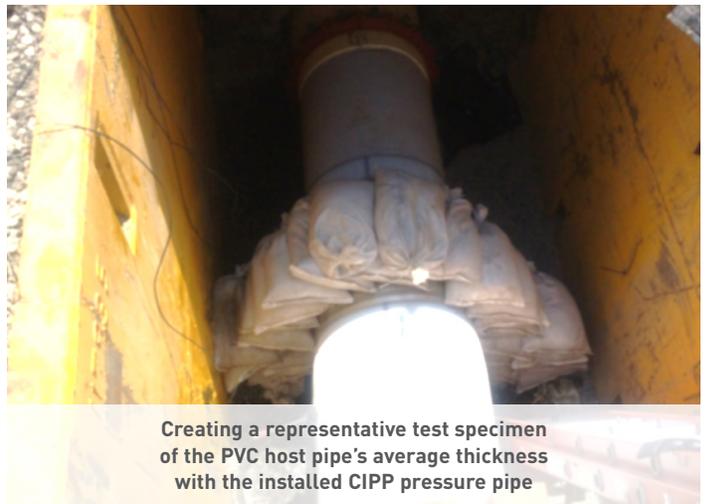
*Tim Hann, Vice President and West Area Manager  
Insituform*



Pre-inverted CIPP downtube secured to the top of the conveyor and locked into position inside of the refrigerated transport, ready for installation



Engineered steel frame set at grade and secured in place for installation of the CIPP



Creating a representative test specimen of the PVC host pipe's average thickness with the installed CIPP pressure pipe



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