

New Jersey American Water (NJAW) Bound Brook

Initiates Rapid Systemwide I&I Detection and Accelerated Analysis

New Jersey American Water (NJAW) is the largest water service provider in the state of New Jersey, serving approximately 2.8 million people in 190 communities. They currently own and/or operate 28 wastewater systems with 21 wastewater treatment plants, 76 lift stations, and more than 480 miles of pipe. Over the last five years, NJAW has invested over \$105 million into wastewater system assets, including wastewater mains, treatment plants and lift stations, to continue to provide reliable and environmentally sound service that complies with federal and state wastewater environmental regulations.

The Challenge

Following the acquisition of the Bound Brook sewer collection system in August 2022, NJAW wanted to identify and reduce inflow and infiltration (I&I) in the system. Traditional I&I isolation methodologies require 18 to 24 months of field assessment and analysis. NJAW's desired an innovative approach to significantly reduce the amount of time required to gather data in order to launch design/build improvements up to 12 months sooner.

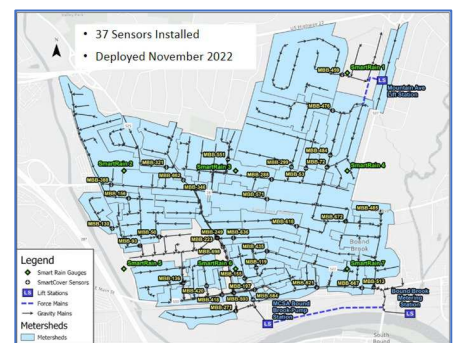
The Solution

SmartCover's sewer monitoring technology, combined with data evaluation methods developed by the Hazen and Sawyer (Hazen) team, was selected to accelerate the traditional identification of I&I in the collection system. In an effort to expedite the characterization of Bound Brook sewer assets, NJAW built out the entire system with 40 satellite-based monitoring units to provide real-time data.

I&I identification efficiencies were gained by collecting water level data generated at selected manholes with equipment placed strategically throughout the collection system network. The remote sewer monitoring technology integrated National Oceanic and Atmospheric Administration (NOAA) weather (doppler radar) as well as United States Geological Survey (USGS) river/stream and ocean gauges. Typical dry weather level patterns were compared to manhole level responses during rainfall/wet weather events.

Highlights:

- Recognized significant time-savings over traditional I&I analysis
- Enabled launch of capital improvements more quickly
- Allowed targeted analysis through real-time data to make better-informed capital decisions

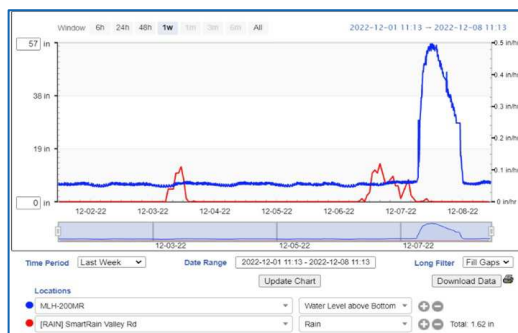


SmartCover Current Deployment

This evaluation provided collection system information which indicated the extent of potential I&I throughout the system with improved coverage, greater speed, and reduced cost. Simultaneously, the data produced by the SmartCover technology was used to identify and predict system surcharges and associated flow obstructions or material blockages. The NJAW Operations & Maintenance team benefitted from both the real-time alarms and predictive alerts by taking proactive actions before issues occurred.



Water Leak or Infiltration and I&I



Storm Related Surchage

The Results

Following adequate dry weather “calibration time” and a sufficient number of wet weather events, the analysis recommended leaving many level monitors in place to continue collecting data while others were relocated to further pinpoint potential sources of I&I. The relocation or re-deployment process involved moving SmartCover sensors from locations with little or negligible I&I indication (or periodic blockage issues) to alternate locations in the system that could benefit from further evaluation. This included moving the sensors to upstream locations to further refine the evaluation results and more closely isolate potential I&I locations. The I&I data collection/evaluation process required a minimum number and intensity of wet weather events to capture the full range of system flow responses. This process allowed for quick and efficient isolation of potential I&I to smaller areas to better focus field investigations and subsequent system rehabilitation plans.

The system-wide deployment of sensors also facilitated timely cleaning to address dry weather blockages, drastically reducing SSOs. Within the first four months of operation, the pilot prevented 16 SSOs. The sewer monitors utilize real-time alarms to dispatch crews before overflows occur and thereby eliminate environmental and community impacts associated with SSOs.

In addition to reduced SSOs, the smart sewer system allowed NJAW to extend the life of sewer mains by limiting unnecessary cleanings and optimized crew time by minimizing safety risks in the field, truck fuel costs, and GHG emissions. The ability to quickly respond to (and correct) collection system issues is critical for NJAW to maintain safe, reliable service over a wide geographic area.

Conclusion

SmartCover has allowed NJAW to perform targeted analysis on their sewers, providing real-time data and alarms to prevent sanitary sewer overflows, backups, and subsequent cleanup. The units are providing valuable data to make quicker, informed capital investment decisions.

Most importantly, by integrating the monitoring and data analysis capabilities of the SmartCover and Hazen teams, NJAW was able to efficiently identify potential I&I throughout its Bound Brook-area wastewater collection system. This process led to significant time savings over traditional I&I investigation and analysis methods, enabling NJAW to launch design and rehabilitation plans much sooner. It is a key tool in the utility’s toolkit for collection system maintenance and replacements. Given the project’s success, NJAW plans to utilize this process in other acquisitions.