

# SIMULTANEOUS SAMPLING



The Springfield Metro Sanitary District faced many challenges as it sought a cost-effective way to conduct water sampling at multiple sites.



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Portable refrigerated samplers are able to meet the needs of the Springfield, Ill., Metro Sanitary District (SMSD) for simultaneous sampling at all designated locations within a watershed area by implementing a combination of flow monitoring technology, automated sampling and custom-design remote communication.

Water district applies portable refrigerated samplers in its watershed



New communication solutions allow the district to completely analyze a storm's impact throughout the entire watershed area.

## ARTICLE SUMMARY

**Challenge:** Comprehensive CSO monitoring frequently demands simultaneous sampling of surface waters in multiple locations during a defined storm event.

**Solution:** SMSD installed wastewater samplers with the unique capability of notifying each other to start sampling the moment an overflow was detected at any one of multiple monitoring sites.

**Conclusion:** Custom cellular communication for its automated wastewater samplers enabled the district to quantify the site-specific impacts of multiple CSOs at one time throughout its watershed area, while increasing safety and reducing costs.

### Simultaneous CSO Monitoring

One of the wet-weather challenges faced by many urban sanitary districts is the need to determine the pollutant concentrations carried in combined sewer overflows (CSOs) during a given storm event in order to understand their impact on receiving waters and the environment. Cost control is a major factor when dealing with the manpower, safety measures and timelines involved in preserving these surface water samples from collection point to analysis. This challenge is multiplied when the samples must be collected simultaneously from several different sites.

SMSD contracted with consulting engineering firm Crawford, Murphy & Tilly (CMT) in a flow monitoring project that collects data from several CSO structures. When overflows occurred, samples had to be collected in order to measure the effect of this discharge on surface waters throughout the watershed area.

### Comprehensive Safety & Cost Analysis

Sample collection during inclement weather presents unique issues of safety and staffing. Without a more advanced system, the firm would be required to have personnel available around the clock to manually start the samplers during qualifying storm events, as well as retrieve the samples before degradation set in.

A popular solution is the automatic wastewater sampler, which can be set up days ahead of a defined storm event and then “wakes up” when the event occurs to collect samples according to site-specific programming. With refrigeration, the sampler can preserve the samples until a safer, more convenient pickup time. Additionally, a smaller, lighter refrigerated sampler adds the mobility and flexibility often required for surface water evaluations.

The Avalanche portable refrigerated sampler from Teledyne Isco, Lincoln, Neb., includes all of these features. But the problem still remained: How could CMT make all of the samplers stationed throughout the watershed begin sampling the sewers and stream simultaneously the moment an overflow was detected? Teledyne Isco’s Special Products Department went to work developing a custom solution to fulfill CMT’s needs.

### Sampling in Sync

New circuitry was added to an existing digital cellular modem regularly used with Isco water monitoring equipment. The new circuitry enables the modem to sense an incoming text message, waking up the sampler, which begins running its sampling program while making a few calls of its own.

CMT installed the new modems at SMSD Spring Creek watershed sites, including an Avalanche connected to an Isco Model 2105 interface module and either a Model 2150 area velocity flow module, ADFM Pro20 velocity profiler or liquid-level actuator. When one of these flowmeters senses water in an overflow structure, it notifies the sampler, which then sends SMS text messages to up to three other samplers at different locations within the watershed. Each of these samplers then sends a message to the next level of samplers and/or to field personnel.

In this manner, a single sampler has the ability to simultaneously activate all other samplers within the watershed to provide a complete analysis of a defined storm’s impact throughout the entire watershed area.

Isco’s communication solutions gave CMT the flexibility needed to gather the necessary stream data, according to engineering staff that worked on the SMSD project. Staff also noted that the modem can be tripped not only by a text message from another sampler but also by phone call or server alarm, depending on the particular need.

CMT continues to utilize Avalanche samplers and 2150 flowmeters within the SMSD watershed. **wwd**

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