Simultaneous Sampling Throughout a Watershed Area

How Isco Samplers "talk" to each other

Springfield, IL

TELEDYNE ISCO
A Teledyne Technologies Company

Expertise in Sampling

Teledyne Isco's Avalanche® portable refrigerated samplers are able to meet the needs of the Springfield Metro Sanitary District for simultaneous sampling at all designated locations within a watershed area, by implementing a combination of flow monitoring technology and remote communication.

Avalanche® Sampler applications

- Stormwater runoff compliance
- TMDL and watershed monitoring
- Enforcement monitoring
- Advanced sampling combined with data logging and communications for flow, rainfall, and water quality parameters

Avalanche® Sampler standard features

- Standard/Extended programming
- NEMA 4x, 6 (IP67) controller enclosure
- SDI-12 multi-parameter plug-and-play
- 512K memory

Springfield, Illinois

Springfield Metro Sanitary District (SMSD) contracted with the consulting engineering firm Crawford, Murphy and Tilly (CMT) in a flow monitoring project that collects data from several combined sewer overflow (CSO) structures. When the water from each of these flow structures is bypassed to a river flowing through the watershed, samples must be collected in order to measure the impact of this discharge upon surface waters throughout the watershed area. SMSD and CMT contacted Teledyne Isco for assistance.

Sampling in Sync

The challenge was to find a way for the Teledyne Isco Avalanche samplers stationed throughout the watershed to all take a sample from the sewers and stream simultaneously once an overflow is detected. 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.

Isco went to work developing a custom solution to fulfill CMT's particular needs.

Solution: Custom Messaging System for Isco Samplers

New circuitry was added to an existing digital cell phone modem used with Isco equipment. The new circuitry allowed the modem to sense an incoming call or text message and unlatch a disable condition in the Avalanche sampler.

CMT installed the new modems in sites within SMSD's Spring Creek area that also included an Isco Avalanche sampler connected to a 2105 Interface Module, and either an Isco Model 2150 Area Velocity flow module, ADFM Pro20 Velocity Profiler, or Liquid Level Actuator. When a flow meter senses water in an overflow structure, it notifies the Avalanche, which then sends 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.

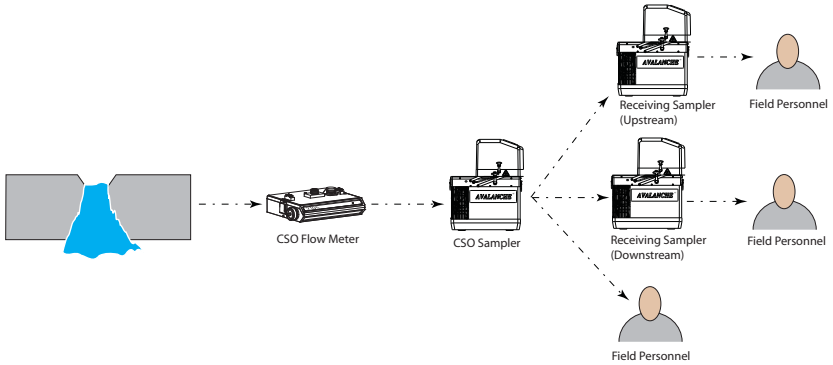

Figure 1: SMSD Spring Creek communication flow chart

"Your Source for Samplers!"

2150 Area Velocity Module

- Digitized factory-calibrated AV sensor
- Secure data storage
- Modules stackable up to 4 per site
- Serial communication up to 38,400 bps

2105 Network Interface Module

- Sampler enabling & pacing
- Variable rate data storage
- Alarm generation
- Optional GSM or CDMA cellular communication
- Inputs include:
  - Isco flow meters
  - Rain gauge
  - SDI-12
  - Modbus

"Isco's communication solutions gave us the flexibility needed to gather the necessary stream data."
–Nathan Davis, P.E.,
Crawford, Murphy & Tilly, Inc.

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

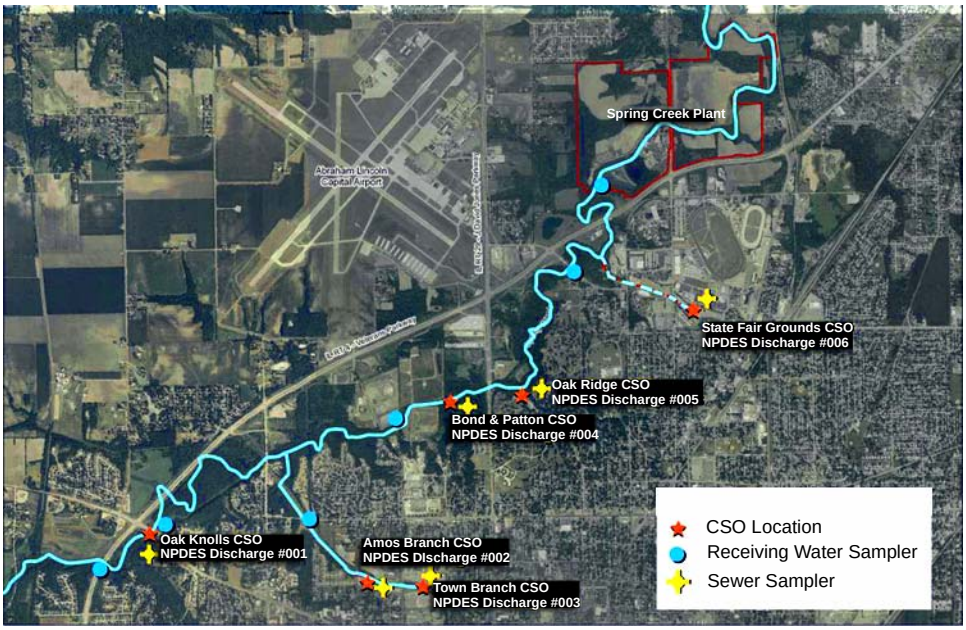

Figure 2: SMSD Map of sampler locations in the Spring Creek watershed area

CMT continues to utilize Avalanche samplers and 2150/ADFM flow meters for the Springfield Metro Sanitary District watershed project.

Figure 3: Avalanche sampler in environmental enclosure With cellular modem, ADFM Pro20 Velocity Profiler, and 2150 Area Velocity Module

Teledyne Isco, Inc.
P.O. Box 82531, Lincoln, Nebraska, 68501 USA
USA & Canada: (800) 228-4373 • Phone: (402) 464-0231 • Fax: (402) 465-3091
Web site: www.isco.com • E-mail: IscoInfo@teledyne.com

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A Teledyne Technologies Company