

Remote Monitoring of Runoff

Automatic, portable sampling systems provide "turn-key" solution

As environmental regulations tighten and public awareness of water pollution sources increases, remote runoff monitoring sites are starting to become a reality all over the world. These sites may be in isolated locations or in some of the busiest airports in the world. There are typically no electrical or communications lines available, and site access is often difficult or restricted.

Airport Deicing Runoff Monitoring

Water pollution from airport and aircraft deicing operations has recently come under particular scrutiny, leading to increased state and federal study and regulation of pollutant releases from aviation facilities. Responding to these environmental water quality initiatives, Isco has installed remote monitoring stations at several major airports. The project began when a consulting engineering firm contacted Isco looking for sequential samplers that could be activated remotely at the start of a runoff event, to collect one sample per hour for 24 hours. This type of remote activation is easily accomplished using an Isco 6712 Sampler equipped with a telephone modem.



Challenges presented by the airport monitoring sites include the absence of telephone lines and AC power. These challenges were met by using cellular telephones for remote communication with the samplers, and a deep cycle battery and solar charger capable of powering the system with complete independence from utility lines.

Isco has installed cellular telephones to control other remote monitoring systems, so this was a simple adaptation. Isco was also able to provide a complete "out-of-the-box" solar system that consisted of the solar panel, charger, regulator, and battery. This solar system will furnish enough capacity to power the sampler and cellular telephone indefinitely, eliminating the need for site visits during periods when no samples are collected.

Isco also recommended that each sampler be equipped with optional remote phone command software, a 700 Series area-velocity module for flow monitoring, and ProPak 1-liter disposable sample bags for clean, convenient sample collection. Combined with factory-assisted installation and a prefabricated, portable enclosure, this allowed Isco to provide a complete "turn-key" system for each site.



Monitoring enclosure located on the edge of runoff collection basin, above the culvert where flow sensor is installed.

Installation

Installation at each site took less than 2 hours. First, the equipment platform constructed by the engineer to provide a firm, level foundation was set in place. The enclosure was then mounted on the platform and the sampler, solar power system, and cellular telephone were placed inside. The area-velocity probe was mounted to a sensor mounting plate and fastened to the bottom of the concrete box culvert. Finally, communications were tested using a hand held cellular telephone to call the sampler and instruct it to begin sampling.

Each of the sites serves as a sampling point for runway runoff for the monitoring of COD during the deicing season. The operator will simply telephone the appropriate sampler during a deicing runoff event and command it to start its sampling program. Flow monitoring is of secondary importance and is only being done to determine approximate total discharges during deicing events.

The addition of an Isco rain gauge and air temperature sensor at each site would enable fully automated sampling response to local weather conditions, along with logging of rainfall and temperature data by the 6712 sampler.



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