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PROCESS ANALYZERS

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ChemScan® Application Summary #170 Reservoir System Monitoring

Statement of the Problem

Reservoirs and other storage facilities are a necessary part of a water distribution system. Elevated storage tanks or standpipes with gravity distribution and in-ground tanks or reservoirs with pumped distribution are designed to provide the necessary quantity and pressure to meet the demands placed on the system. The effect that these facilities can have on water quality is another important consideration.

The size and turnover characteristics of the storage facility will have an impact on water quality. Periods of non-use or low turnover can promote conditions that are favorable to the formation of biofilms and the loss of disinfection residuals. Standpipes or large reservoirs may have little or no forced recirculation or mixing and may, therefore, have internal zones with differences in water chemistry, microbial content and disinfection residual. Zones with differing water quality are frequently characterized by differences in water depth, temperature, hydraulic turnover, flow rate, materials of construction, and/or exposure to external influences.

The Interim Enhanced Surface Water Treatment Rule (IESWTR) prohibits building any uncovered storage facility for finished water after February 16, 1999. This is an effort to limit the recontamination of treated water. There are, however, numerous uncovered storage facilities that were constructed prior to the IESWTR effective date.

Reservoir Monitoring

The EPA guidance manual for Uncovered Finished Water Reservoirs (EPA 815-R-99-011, April 1999) specifically recommends:

“Water utilities should consider online continuous monitoring equipment, especially at reservoir inlets and outlets. Data from continuous monitoring will help establish a correlation between reservoir and distribution system water quality. Utilities should also consider the use of permanently installed sampling lines to facilitate sample collection.”

Uncovered reservoirs are also a security concern. (See ChemScan Application Summary #171, Water Security Monitoring.)

Covered or uncovered reservoirs and storage facilities are also subject to the same concerns and influences as are the other points within the distribution system. Large storage facilities with low turnover volume or with zones that are subject to differences in water quality are a particular concern and should be considered as a location for monitoring and disinfectant adjustment. (See ChemScan Application Summary #169, Distribution System Monitoring.)

ChemScan Analyzers

ChemScan analyzers can detect individual or multiple parameters necessary for water quality monitoring including free or total chlorine, monochloramine, free ammonia, total ammonia, hardness, iron, manganese, nitrate, nitrite, turbidity and/or color. Chemical monitoring systems can be supplemented with other sensors such as pH and conductivity as needed for complete water quality analysis at each location.