

## SRSF Theory

Design experiments that measure head loss, influent turbidity, and effluent turbidity over the course of a filter run. The length of the experiment should be set based on maintaining an effluent turbidity of less than 0.3 NTU (after an initial ripening period) given an influent turbidity of 5 NTU. We expect filter run times to be approximately 12 hours, but confirm this by experimenting. Collect a family of performance curves ( $pC^*$  and head loss) by varying the coagulant dose while maintaining a constant raw water turbidity.

While the experiments are running, develop a model for the mass of clay that can fill a pore before the flow path through the pore has a smaller diameter, the velocity is higher, the shear is higher and hence no more particles attach. See if you can create a model with a minimum of unknown parameters for the pore storage volume as a function of the coagulant dose. The model should also predict head loss as a function of coagulant dose and mass of solids accumulated.

One of the possible applications of this research will be to evaluate the selection of 20 cm as the layer depth for SRSF. In addition it may be possible to provide guidance for the maximum head loss that a SRSF can sustain before particle breakthrough becomes excessive. Finally, it may be possible to provide recommendations on the optimal coagulant/clay ratio for efficient filtration.