Foam Filtration Summer 2010

High Velocity Polyurethane Foam Filter Performance Study

Since laboratory research has shown that horizontal flow foam filtration is not a feasible method for achieving the desired filtration performance, it is necessary to manipulate the geometry of the proposed foam filtration unit in another way. With a high velocity foam filter, the depth of the foam will be increased to accommodate the increased velocity. With an increased filtration velocity, the filtration unit will require less planned area, which reduces the associated construction and maintenance costs.

We would like to analyze the impact of the variation of parameters within our foam filtration experiment in order to determine the optimal set of parameters to design a filtration unit for, and the range conditions which the filter will be effective for. The parameters we will study are filter depth, filtration downflow velocity, influent turbidity, and presence the of an alum dose.

Foam Filter Depth Variation

In order to decrease the required plan area for the proposed filtration unit, it is necessary to increase the flow rate through the filter. Based on the finding from the Depth Filtration Experiments that foam filtration performance is a function of depth, it is necessary to increase the depth of the foam with the increased filtration velocity in order to maintain an acceptable level of filter performance.

Influent Turbidity Variation

We would like to know the range of influent turbidites for which the filter will be effective under, and the associated change in head loss over time for increased turbidity.

Filtration Downflow Velocity Variation

We would like to analyze the change in performance associated with the variation of flowrate at a constant filter depth, as well as the associated increase in head loss.

Effect of Alum Dose

It is necessary to understand the impact of the Alum dose on filter performance. Therefore, replicate experiments without an alum dose will be performed and analyzed.