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Andrea Fortman's Individual Contribution Page

Spring 2013 Contributions

This semester, I am working with the sedimentation tank team to discover the effects of floc hopper geometry on sedimentation tank performance. Additionally, the team is testing the optimal upflow velocity, switching to PACI coagulant, and running experiments to determine the relationship between energy dissipation, floc break-up, solids concentration within the floc blanket, and floc blanket performance. First, we found that the optimal dose for PACI is 5mg/L, which we used for all other experiments. However, we also found that PACI is extremely sticky, which made measuring floc blanket concentration unreliable. We tested the effect of floc hopper depth on sludge consolidation and found that allowing sludge to build up to 100 cm allowed for twice as much sludge to consolidate in a 1000 mL sample as when the sludge was only allowed to build up to 50 cm. We also tested a range of energy dissipation rates from about 1 to 130 mW/kg and found that at higher energy dissipation rates, floc break-up increased and steady-state floc blanket performance increased. The best floc blanket performance occurred at 130 mW/kg, which coincided with a jet diffuser diameter of 0.46 cm. This is about half a centimeter smaller than jet diffusers currently being used, which means that materials costs can be reduced while also increasing floc blanket performance.