

Laminar Tube Flocculator Group's Detailed Task List Spring 2014

Yining Dai and Victoria Chou

February 5, 2014

Goals

- Design and setup the settled water turbidity (SWaT) measurement system (work with the Turbulent Tube Flocc team)
- Run multiple experiments including: Base Case, Clamp Size, and Tapered Flocculation
- Draw conclusions that either support or refute the Flocc Breakup Theory

1 Design SWaT

Finish by February 14th

- Create an AutoCad design of SWaT with a turbidimeter that can accurately measure low turbidities at a rate of 1 mL/s and capture velocities between 0.1 to about 0.5 mm/s
- Identify design parameters and restrictions on the geometry of the tube settler

2 Implement SWaT

Finish by February 28th

- Setup the SWaT system and integrate into the current system
- Run at least three base case tests to troubleshoot for any fluctuations in data points around higher dosages of PACl

3 First Test: Base Case

Finish by March 7th

- Run Base Case testing (no clamps) to see if there is consistent data (Use the dosage range of PACl from Fall 2013 Research)

4 Second Test: Clamp Size

Finish by April 4th

- Run three tests on each clamp size using the 4 mm, 5 mm, 6 mm, and 7 mm sized clamps for middle-clamp testing (see what kind of effect the clamps have on residual turbidity)
- Compare error bars and residual turbidity graphs of Spring 2014 Data with Fall 2013 Data
- Come up with conclusions in regards to Karen Swetland's Floc Breakup Theory

5 Tapered Flocculation

Finish by end of the semester

- Design a tapered flocculator system with energy dissipation rates starting from 1000 mW/kg
- Implement the tapered flocculator system
- Run experiments testing the tapered system on the effects on residual turbidity

Technical Writing and Presentation

Finish by end of the semester

- Update research report weekly
- Plot SWaT as a function of the energy dissipation rate taking into account the residence time between the clamp and the turbidimeter
- Prepare for Final Presentation and Symposiums
- Decide on tasks and research topics for future Tube Flocculator Teams