

# Floc Sed Optimization Task List

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September 6, 2012

## Abstract

The general goal of our team is to examine the effects of adding a floc recycle to a filtration system. We will run the apparatus at different coagulant doses without floc recycle, two times each, and then run the apparatus with floc recycle at the different coagulant doses, two times each.

## Tasks

1. Clean the work space and apparatus.
2. Understand process controller and apparatus configuration.
3. Change incoming location of floc recycle so that it enters before the coagulant is added.
4. Change out coming location of floc recycle from the sedimentation tank to the floc weir. (It is possible that the first position, which takes floc from the fluidized bed may be better. The max withdrawal flow rate can only be the upflow  $Q$  of the floc blanket. The floc recycle flow should probably only be (at max) 10% of the total flow, so some of the weir solids may also need to be wasted.)
5. Calculate residence times using Mathcad.
6. Run the first control test for a length of two solid residence times with a coagulant dose of 45 mg/L and develop a floc blanket starting with water at 100 NTU and then scale down to 15 NTU, while maintaining a floc blanket. Collect data and repeat.
7. Add floc recycle to first test series, at a coagulant dose of 45 mg/L and collect data.
8. Change location of incoming floc recycle (to former position) and repeat

9. Run the second control test for a length of two solid residence times with a coagulant dose of 30 mg/L and develop a floc blanket starting with water at 100 NTU and then scale down to 15 NTU, while maintaining a floc blanket. Collect data and repeat.
10. Add floc recycle to second test series, at a coagulant dose of 30 mg/L and collect data. Change position of recycle input and repeat.
11. Run the third control test for a length of two solid residence times with a coagulant dose of 15 mg/L and develop a floc blanket starting with water at 100 NTU and then scale down to 15 NTU, while maintaining a floc blanket. Collect data and repeat.
12. Add floc recycle to third test series, at a coagulant dose of 15 mg/L and collect data.
13. Analyze data